

THE PRACTITIONER

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LONDON:
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HIS MAJESTY'S PRINTERS,
DOWNS PARK ROAD, E.8.

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JANUARY—JUNE 1929

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HOWARD STREET, STRAND, LONDON, W.C.2.

1929

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JANUARY

1929

The Value of Sleep.

(1)

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“SLEEP is a generous robber, giving back in strength what it robs in time.” The protracted correspondence in the *Times* (in August, 1928) relating to speed and noise, fully justifies the present symposium on sleep, if any justification were needed; in particular from the mental and nervous aspects. The views expressed there are a fitting preliminary to a special study of this subject in THE PRACTITIONER. Furthermore, the last annual report of the Public Health Department of the London County Council (1928), just issued, emphasizes the need of sleep for growing children. As is well known, the curtailment of sleep is not only injurious to adults, but it is especially harmful to children. On page 67 of this report is stated: “More than one of the school doctors has remarked upon the ‘nervousness during the past year of so many of the children.’” The doctors assign

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Every country has its legends about sleep. The seven sleepers of Ephesus (about A.D. 250), persecuted for their adherence to Christianity by the Emperor Decius, "fell asleep in the Lord." Their bodies were re-interred in Marseilles, and are today reverently shown to the credulous. St. David was awakened by Merlin and Merlin (Spenser's "Faerie Queene") fell into a magic sleep, and sighs in an old tree. Epimenides, the Greek poet, awoke after fifty-seven years' sleep and found himself possessed of all wisdom. Rip van Winkle awoke after twenty years to find himself unknown and unknowing. These fables have a moral, namely, that it is possible to live a useless, worthless and a futile life; or, in other words, to sleep one's life away.

Some physiologists have regarded sleep as a defence mechanism to prevent the body from being run down or exhausted and, therefore, to be an instinct, a biological necessity. The tired person must rest, and is obliged to sleep, or he would otherwise be poisoned with his own toxins, which in sleep are eliminated before they become injurious, and he is thus restored. Others are opposed to the defence mechanism and deny that sleep is protective or has a teleological effect.

It is a very ancient idea that sleep is a restorative to the nervous system. It is described as the prime restorer of exhausted nature. That the products of functional activity which have accumulated in the waking state are eliminated during sleep causes sleep to act as a restorer. Experience lends colour to this view, for fatigue induces sleep, and after hard work sleep naturally supervenes. We know when we are tired that sleep is often as profound as it is irresistible, and one of the theories as to the cause of sleep is that the waste products following activity accumulate in the blood and so directly produce a toxin which causes sleep. The proximate cause presumably is the want of oxygen, because oxygen is indispensable to the activity

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this nervousness, "varying from mere restlessness to actual chorea to the lack of restful sleep at night . . . and this want of sleep reacts badly upon the nervous stability of the child." One of these doctors (Dr. Mabel Russell) considers that the kind of sleep, restful or otherwise, i.e. the quality, is of greater importance than the actual hours. It may still be insufficient, although the child may be resting the normal number of hours. Some of their restlessness is attributed to insufficient sleeping accommodation for the family, the highest average number of rooms available for a family of three in the families investigated being not more than three rooms for all. Others have stated that the summer-time hours by lengthening the evenings at the same time shorten the hours of sleep, but this drawback is more than counterbalanced by the advantages of sunshine secured to them.

It is accepted physiologically (Luciani) that resting for several hours in darkness and silence whilst lying down may bring about some restoration and some new flow of vitality to the nervous system, but it is not possible whilst awake to bring about the full mental restoration needed by sleep. Such restoration is but partial, as the "neurons" only recuperate during sleep. It must be the complete interruption of all psychical and sensorial stimuli—however brief and which healthy sleep secures—that can restore and renovate the highest centres of the cerebral cortex which subserve mental activity, although the body may thus be repaired and restored. We can lie down and close the eyes so as to cut off most external stimuli, and a weary, jaded brain may be refreshed after such a pause, but this can only tide over a crisis and cannot take the place of natural sleep. Some animals hardly sleep at all, as is the case with some rodents and herbivoræ. Others sleep the whole winter (bats, the bear, dormouse, field mice, squirrels, insects, etc.).

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of the brain in the waking state. For this reason sleep, and in some animals hibernation, is said to be due to the accumulation of CO_2 in the blood. If this were true, then in exhaustion more CO_2 would remain in the blood, and the deeper should be the sleep, which is not always the case.

What, it may be asked, is sleep? Some have referred to it as a natural rhythm, that it bears a resemblance to the alternation of day and night, that rhythm is innate in Nature—after activity comes rest, after energy torpor, after mobility quiescence, and after waking comes sleep, because it is a law of Nature that action and reaction are always equal and contrary.

This rhythm—if it be so—is seen not only in man and animals, but also in the vegetable kingdom. Witness, for instance, the leaves and flowers of many plants which expand by day and shrink at night. Not long since an Indian scientist described a rudimentary nervous system which, he said, was characteristic of trees, plants and vegetables.

Rousseau declared that the “time of rest is night time,” also that “sleep was more placid when the sun was below the horizon”; and it is generally agreed that daylight sleep is less recuperative, less profound, and less refreshing than night sleep. It is also said that sleep is most often a matter of suggestion, for we go upstairs to bed, which suggests a definite purpose in view, we place ourselves in a position of relaxation, and as a result of this suggestion, coupled with the daily habit of repetition at the same hour, sleep results. The suggestion of Coué that the restless sleeper should repeat several times “I am sleeping” often induced sleep, although it has been said that to think of “the other fellow” asleep is more conducive to this than to think of himself (auto-suggestion) asleep. As we know too well when tired, and the attention wanders, unaccustomed conditions and surroundings may induce

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sleep: a dull lecture, a monotonous sound, the shaking of the train, darkness and silence may bring on sleep even when we struggle against it.

It is a universally accepted fact that sleep has a beneficent action on the body as a whole, but particularly upon the psycho-physical functions of the central nervous system, and the loss of it may be felt more than the want of food. Indeed, sleeplessness has more remedies to its credit than any other single disorder. Men can fast for several weeks, but loss of sleep, even for a few days, may prove fatal. It is recorded of three boys that after a boast they could remain awake for a week, one was disabled after four days, one after five and the other died on the seventh day. Weir Mitchell relates the history of eighteen students, working for examinations, who exhibited grave symptoms of cerebral excitation and mental confusion from which it took many weeks to recover. Animals subjected to enforced wakefulness showed marked chromatolysis of the neurons, and especially of the psycho-motor or highest type of neurons. Hallucinations, delirium, loss of memory, drowsiness, and, finally, mental breakdown result from loss of sleep. The mind becomes sluggish, the senses less acute, and, finally, insanity may supervene. From the oldest times the deleterious effect of prolonged waking has been recognized, and the ancient physicians, Hippocrates, Galen and Celsus, also Aristotle, have referred to this.

In acute insanity loss of sleep is one of the most distressing symptoms; indeed, it is the most universally present of the serious signs which must be controlled if recovery is hoped for. Even after a few nights of sleep, in insanity, there is a relapse into a recurring restlessness at night, the neurons being unable to retain their fresh nerve-potential as the sleeping charts obviously demonstrate. In the treatment of early cases of insanity sleep must be secured at all cost. It

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(2) Chemical theory, due to the accumulation of products of fatigue caused by functional activity during the waking state. CO_2 is the chief chemical element present, and sleep is due to what has been called carbonic auto-narcosis; but this cannot account for the sleep which occurs as the effect of darkness or silence, nor does it account for the obstinate insomnia of the mentally afflicted, nor its absence in the light sleep of the neurasthenic. It is accepted that the neurons are restored by oxidation, but this does not imply that sleep is caused by carbonic acid poisoning; yet breathing exercises in front of an open window help sleep.

(3) Histological—due to retraction of the neuro-dendrites, so as to isolate the neurons and inhibit the transmission of nerve currents (Lépine). But an opposite view has also been put forward (Lugaro) viz., that the gemmules on the dendrites are prolonged and protruded so as to be in partial contact with all the others, and thus diffuse the nervous currents and prevent mental concentration and so favour sleep. The writer considers that the first of these views appears to explain the phenomenon of "partial" sleep which so often occurs, as when reflex jumps or jerks are experienced.

(4) Biological—that sleep is a defensive function and is, therefore, an instinct that has gradually evolved in the course of man's progress; that it is a necessity for survival, as has already been mentioned.

(5) The secretions of the ductless glands have been held responsible for sleep. The thyroid is said to be enlarged before hibernating.

(6) Osmosis, bringing about the dehydration and increased viscosity of the blood, has also been regarded as a cause.

Dreams which are conscious manifestations of mental activity during sleep have been raised into undue

is an essential to restoration; yet there are some who can carry on severe mental work and remain in health with a minimum of sleep—four or five hours a night appear to suffice for some few of the great brain workers—and our personal experience can relate many cases of this individual toleration and resistance which is not infrequently hereditary, as wakefulness is sometimes noted in families of the intellectual or nervous type, i.e. in those who are predisposed to conditions of nervous unrest. The frenzy of emotion which great political and social leaders experience tends to profound mental unrest. In these persons life is not lived at a flat rate; their minds are excited, their memories quickened—one reminiscence follows another—the play of their emotions is deeply stirred, and their intelligence is often vivid and intense, so much so that they are in a whirl of mental delirium with sleeplessness as a consequence. Their mental and physical activities have been too acute for sleep to intervene, their sense of temporary well-being is too vivid for rest to follow their activity, but they often have to take compulsory rest. The brain-worker is a great contrast to the placid, resigned and patient manual worker; yet it is the highly-strung nervous person, and not the phlegmatic and contented individual, who does the work of the world.

As to the actual cause of sleep there are at least half a dozen plausible suggestions:—

(1) The earliest was the circulatory theory enunciated by Durham, who suggested an ischæmia of the brain, a contraction of the cerebral vessels being observed during sleep; and in a case of hernia cerebri under the writer a measured diminution in size occurred in sleep; others most unaccountably have adduced opposite observations suggesting instead a vaso-dilatation of the cerebral vessels. Probably both theories are accessory phenomena.

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His mind must be withdrawn from himself during the day, which is the only way to relax the mental strain. Physical exercise is the best preparation for sleep, but all this entails severe discipline and self-denial. Discipline also in the selection of food is necessary, because the brain depends on the harmony and co-ordination of all the organic sensations, though often this want of harmony is not felt or appreciated by the sufferer. The digestive tract is exceedingly sensitive in the restless sleeper, but its irregularities are scarcely noticeable to consciousness. yet any sensory disturbance produces wakefulness. A glass of hot milk and a biscuit or a hot-water bottle in bed often have remarkable effects upon the sleepless. The rule of the bedroom is a most important one. It should be quiet, cool, and with open window, but darkened, and the bed without hollows or inequalities. A jug of cold water poured over the back of the head followed by a rub with a rough towel is infinitely better than drugs. Hot baths before retiring suit some cases, but aggravate others.

There are innumerable drugs advocated, but it is advisable to avoid them all if this is in any way possible, for they are all neuronie poisons; they also tend to establish a habit which is worse than the habit they are intended to relieve, namely, the domination of hypnotics; but if sleep is unattainable, and a mental crisis is threatened, a sleeping draught must be prescribed to allow an exhausted sufferer a chance of repose. It should not be forgotten that constipation is the cause of a vicious circle whose chief are sleeplessness, and a natural saline laxative, such as Hunyadi Janos, every morning will be a true relief. Breathing exercises three times a day before an open window are invaluable for the oxidation which produces sleep. High blood-pressure is a formidable and frequent cause of insomnia in most persons of an

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prominence for diagnostic purposes and treatment by Freud, who has originated a vocabulary in their interpretation too puzzling and difficult for the ordinary reader to comprehend, and, in the opinion of the present writer, too much importance attaches to their scanty help in treatment. Further, they can only be related by introspection, and the relater of his dream, unfortunately, is both subject and object, and their interpretation is, therefore, unreliable.

In conclusion, a few hints may be given as to the treatment of sleeplessness, and the best advice is to try to break the habit of keeping awake, for sleep comes ordinarily with clockwork regularity, and it must be met with regularity in the daily life. Generally speaking, this means a great exercise of self-denial. Systematic mapping out of the day must be made, and once made adhered to; early rising to begin with, then work, punctuated by regular meals, followed by half an hour's rest after each, a fair allowance of exercise and recreation so as to break the continuity of mental work; but the recreation must be a real distraction, and must be entered into with heart and mind, and be pursued genuinely and not as a make-believe. A round of golf with the solitary "Colonel Bogey" is futile, for the mind of the sufferer, generally a brain worker, has acquired the habit of working and never giving up thoughts of his job until he has mastered it. This has entailed concentration and persistent focusing of the attention so that distraction is impossible. The mind of the sufferer continues busy with its own pursuit and investigations so he must become diverted; but his recreation must be wholehearted, and the best is his own reaction to the unexpected play of others; a foursome at golf is better, a game of tennis, driving a car, a long motor ride, a walk to and from his job or through a jostling crowd. His recreation should have a purpose.

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The Value of Sleep.

(2)

By J. S. RISIEN RUSSELL, M.D., F.R.C.P.

*Consulting Physician to the National Hospital, Queen Square, for
Diseases of the Nervous System.*

IT would appear that every one must recognize the value of normal sleep, but in reality, like many other good things in life, it is not appreciated until it is lost. In qualifying sleep by referring to it as "normal" sleep, I have purposely done so for two reasons. There are those who, owing to terrorizing dreams and nightmares, dread sleep and even prefer to keep awake, if possible, rather than face such unpleasant experiences as sleep brings.

Then again, there is, of course, the problem of "artificial" as opposed to "normal" sleep. What even artificial sleep can do for a patient is well illustrated by what we see in one suffering from insomnia, in the course of some acute febrile illness, if we compare the patient's condition after even a brief period of sleep so induced, with his state before. The pulse alone bears striking evidence of this. Here let me say that a great many people who become the victims of insomnia have largely themselves to blame, in that they allow the habit of insomnia to become fixed, owing to their dread of drugs, whereas the judicious use of some harmless hypnotic, taken early enough and in sufficient dose, might well have broken the spell and paved the way for the return to normal sleep.

There are, of course, practitioners also who, if I may be excused for saying so, make the same mistake with their patients, by withholding the aid that Nature

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most urgently needs, contending that they do not approve of the use of "drugs" to induce sleep, and thus allowing a habit to be fixed in their patients, who, as a result, become most miserable nervous wrecks difficult to treat with success. I am satisfied that no greater mistake can be made, and assure practitioners who hold these views about hypnotics that they possess in their armamentaria many most useful medicinal agents capable of procuring sleep, which, properly used, have not the least baneful effect and can be given almost indefinitely with only good and not harm to the patient.

It is remarkable how brief a period of sleep may be necessary to refresh the brain and nervous system. It is impossible to consider this aspect of the subject without also considering whether there are not those who take too much sleep, there being a strong probability that, just as the majority of individuals eat too much, so a large number sleep too much. This does not, of course, apply to children, who seem to get far too little sleep in these days of rush, strain and excitement. Modern parents appear to have lost sight of the fact that the nervous system of the young in process of development needs a great deal of sleep, and to deprive it of an adequate amount is to starve it to an extent that leads to various forms of nervous disorders, some of grave significance.

Apart from the question of age, individuals vary very much as to the amount of sleep they require. Making every allowance for this, however, one cannot help feeling that the majority of people fondly believe that they require far more sleep than is really necessary, and are much injured in their feelings if Nature does not provide them with the number of hours of slumber which they consider necessary to their well-being.

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individual jaded by the want of sleep, as compared with one who has had the advantage of some sleep and thus is made calmer and more capable of normal reasoning.

The subject of insomnia raises the vexed question already referred to of the value of hypnotics as opposed to their baneful influence. In my experience there can be no question that, provided the right hypnotic is selected and is administered in suitable doses, no one should be allowed to suffer from insomnia without relief being given by means of sleep artificially induced. Not only is the choice of the hypnotic and its dose all important, but the way in which it is administered calls for careful attention, if we are to hope to restore the brain to a state which allows of the return of normal sleep. The mental state of the individual plays so important a part in keeping up an inability to secure sleep that the dread of a bad night must be taken carefully into our reckoning. Thus it is that with rare exception one makes the rule of giving, in the form of a cachet, whatever sedative is being used, in that the dose can be varied at will without the knowledge of the patient, and the cachet may continue to be given nightly with most beneficial effects long after it ceases to contain one grain of the original hypnotic, which may have long since been replaced by bicarbonate of soda or some equally inert powder.

Intimately connected with the subject under consideration is the effect of pain in preventing sleep. Here we are not dealing with insomnia in the proper sense, but, nevertheless, it becomes all important to secure sleep for the patient. There are, of course, cases of such severity of pain as make nothing short of hypodermic medication by morphia and allied drugs of the slightest use, but happily there are a great many that fall short of this degree of intensity of pain, and which can, accordingly, be dealt with by less

be done without, there are times when it is best avoided. Reference has already been made to the people who dread sleep, owing to terrorizing dreams and nightmares. There are others who make every effort to fight against the common inclination there is to fall asleep after a meal, owing to the fact that they feel so thoroughly out of sorts on waking.

Another feature to be considered, however, is that it often happens that the inclination to sleep may be so overpowering after the evening meal as to make it impossible for the individual to resist, in spite of the certain knowledge that sleeping then will invariably interfere with their night's rest and the amount of sleep to be secured when they go to bed. No general rule obtains, however, for there are those who will sleep soundly after going to bed, in spite of their slumbers before doing so.

Reference cannot be made to this aspect of the subject without considering what obtains in many cases of insomnia. There are, of course, those who are unable to secure a wink of sleep by night or day, but there are others who could sleep at certain times in the day, but who are afraid to do so lest it should lessen their chances of sleeping at night. While this fear is justified if the tendency to sleep comes in the late afternoon or evening, it is not my experience that it holds good if the patient gives way to his inclination to sleep in the morning or the early afternoon. Indeed, in not a few cases, it has seemed to me that such sleep tends to calm the nervous system and put it in a state in which sleep at night is far more likely to result than would happen if a jaded nervous system is called upon to compose itself at night. How great a part the dread of not being able to sleep plays in cases of insomnia is too well known to call for emphasis; and it will readily be recognized how much more the mind must be uncontrolled in this direction in an

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distressing symptoms in this disorder, which, if unrelieved, results in such mental torture as may even lead to suicide. On the other hand, there are those who prefer a bad night, strange as this may seem, for to them it heralds a better day with much less mental depression. Nevertheless, there can be no doubt that sleep is a valuable factor in restoring such patients to health.

Even if we view sleep from the standpoint of the nervous system alone, we cannot fail to be convinced of its importance in preserving or restoring health, and we must equally be convinced that the loss of sleep is responsible for such failure of health as may result in mental as well as physical deterioration.

In no affection of the nervous system is this more evident than in states of delirium or mania. Without sleep, death from exhaustion and heart failure is far more likely to occur, or to do so far sooner than if sleep can be secured. It is, accordingly, all-important that sleep should be induced in some way or other in these patients, so as to tide over the period of excitement, for by husbanding the strength in this way, the individual is afforded a chance of weathering the storm, which would not be possible were Nature left unaided.

In this connection it is, perhaps, not out of place to call attention to the value of hydropathic measures for inducing sleep, which may lessen the need for hypnotics, among which are to be found those which, though most useful, are sometimes responsible for increasing hallucinations.

The depressed and melancholic patient also benefits by sleep, whether induced by hydropathic measures or otherwise, although the immediate effect is, of course, not so evident in them as in the case of the excited patient, who is thereby calmed, at least, for a time.

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drastic measures. In these, some one or other of the simple anodynes in cachet or tabloid form by the mouth is all that is needed, either to allay pain so as to allow of natural sleep, or it may be to thus prepare the way for a hypnotic given a little later to take effect.

That, as has already been said, sleep is not always an unmixed blessing is further illustrated by the fact that many epileptics are well advised not to allow themselves to fall into that second sleep which so often follows on waking in the morning. While attacks of epilepsy may occur at any time by day or night, in no mean proportion of cases the attacks are liable to occur after waking in the morning, and, in my experience, in such cases the attack is far more likely to occur if the patient gives way to this second sleep than if he bestirs himself and gets up on first waking. This is not an invariable rule, of course, but it is true in many such cases.

On the other hand, there are affections of the nervous system in which sleep comes as a boon no matter at what time it can be secured. Take, for instance, a case of severe spasmodic torticollis or any similar affection, in which the unfortunate patient can secure no real rest during the waking hours owing to the torment of incessant movements that go on from the time he wakes until sleep comes to his assistance. Probably in no affection in which spontaneous movements are liable to go on without ceasing for any appreciable length of time is the relief afforded by sleep more welcomed than in paralysis agitans, or the affection closely allied to it, which may follow an attack of sleepy sickness (encephalitis lethargica).

In no affection of the nervous system, however, is sleep more important than in neurasthenia, in which disorder the problem is most complex and full of interest. Insomnia is one of the most common and

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distressing symptoms in this disorder, which, if unrelieved, results in such mental torture as may even lead to suicide. On the other hand, there are those who prefer a bad night, strange as this may seem, for to them it heralds a better day with much less mental depression. Nevertheless, there can be no doubt that sleep is a valuable factor in restoring such patients to health.

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The Value of Sleep.

(3)

By WILFRED HARRIS, M.D., F.R.C.P.

Senior Physician and Lecturer on Neurology, St. Mary's Hospital.

IF sleep is artificially prevented in animals for several days together, experimental work has shown that gradual enfeeblement ensues, progressing to death from exhaustion, with actual degenerative changes visible in the nerve cells of brain and spinal cord. Pushed thus to an extreme degree, want of sleep can be demonstrated to give rise to nervous degeneration, which in lesser degree is obvious clinically by tremors, furred tongue and gastric disturbances, irritability, muscular inco-ordination and weakness, slowness of mental effort and concentration, and actual faulty judgment. Occasionally profound exhaustion from lack of sleep is met with in acute disease, thus hastening a fatal termination. The so-called lethargic encephalitis sometimes produces extreme wakefulness instead of excessive sleepiness, and I have seen a lady who died from exhaustion in this disease after two and a-half weeks of absolute insomnia and restlessness, a large variety of drugs, even in big doses, having completely failed to induce sleep. In pneumonia, too, loss of sleep accompanied by delirium is one of the most serious complications that produce exhaustion and heart failure, and calls for early treatment by the administration of brandy and morphia. Roughly, the necessity for sleep varies inversely with the age of the individual, newborn infants sleeping practically continuously. Occasionally a child has been noticed to be a bad sleeper from the time of birth, a sure sign of a strongly-marked neurotic strain, unless

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the lack of sleep is produced by actual physical pain. It is such children that later on develop habit spasms and various forms of tics, and mental instability of various kinds. In old age, before the faculties fail, it is quite common for the night's rest to be interrupted by short periods of wakefulness, sleep being less deep than in the earlier and more vigorous years of life. When, however, the degenerative age has well advanced, frequent short periods of sleep during the day are common, due to easily induced mental fatigue and the difficulty of maintaining concentration. This is in part due to the advance of cerebral arteriosclerosis and the relative anæmia of the brain. Anæmia of the brain as a cause of unconsciousness is illustrated by the effects of compressing the carotids in the neck, and by the loss of consciousness with convulsions in Stokes-Adams disease. Normal sleep is undoubtedly associated with a relative anæmia of the cortex, although this period is utilized for the renewal of metabolic processes resulting from fatigue of the nerve cells or, as we might say, for the recharging of the batteries of our wireless instrument.

It is this siphon-like rhythm of alternating sleep and waking that becomes disturbed by a period of great nervous strain or worry, often resulting in neurasthenia, or by the toxic or congenital causes that lead to the development of acute mania. During the war I often found that the insomnia associated with the neurasthenia resulting from prolonged strain or exposure, or shell-shock, reacted better to a nerve stimulant such as strychnine than to the usual hypnotics of coal-tar derivation. In the ordinary neurasthenia met with in civil practice strychnine is often badly borne, the patients complaining that they feel on edge and more irritable when taking it. Though not all neurasthenics are sleepless, as some will admit that they sleep long and deeply, yet when insomnia is a feature of the

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The Treatment of Fracture of the Neck of the Femur.

By ARTHUR ROCYN JONES, M.B., B.S., F.R.C.S.

Surgeon, Royal National Orthopaedic Hospital; Consulting Orthopaedic Surgeon, Monmouthshire County Council.

FRACTURE of the neck of the femur is, perhaps, the commonest acquired disability of the hip-joint, and occurs at all ages, but more particularly in the elderly. With advancing age the bones become somewhat brittle and the slender, femoral neck, placed between the trunk and the lower limb, is apt to succumb to any sudden strain. In young people slipping of the epiphysis is the rule rather than pure fracture, and may be the result of a single violence or the cumulative effect of continual stress along a weak epiphyseal line of attachment. The break in the neck is usually transverse with little comminution; the proximal fragment is abducted, and the distal displaced upwards. Clinically, the great trochanter is felt at a higher level than normal, and the limb is shortened by an inch or so. A characteristic sign is the external rotation of the injured limb observed when both extremities lie extended at rest on a bed; this attitude is often very striking even when there is little shortening. Sometimes the fragments are impacted and the clinical signs are masked, but the history, limitation of movement, and possibly pain at the hip should arouse suspicion. The most disarming patient is the one who gets such an impaction of the fracture that he is able to walk immediately after the injury. But if such a possibility is kept in mind then the appearance of a limp, some weakness, and slight outward

disease it is a most important factor in preventing recovery, and one which must be combated by every means in our power.

Before resorting to the use of drugs for the relief of this symptom, suggestion in its many forms should be employed, and slight muscular fatigue, such as a half-hour slow walk in the open air. The usual household remedies, too, should be tried, such as the reading of an unexciting book after getting into bed, a warm drink, hot bottles to the feet, with the bed previously warmed. In spite of all, drugs may become necessary, and it may be accepted that a sleepless night without drugs is more harmful than the use of a hypnotic which produces sleep. Chloral and bromide, aspirin, paraldehyde, medinal, adalin, dial, and a host of others, all have their uses, and some will succeed when others fail, in different cases. Alcohol is sometimes of great value, though great care must be taken with its employment owing to the danger of a habit being established. This is less likely to be the case with the drugs already referred to, though I have seen even a paraldehyde habit in a psychasthenic girl, who would drink it by the ounce if she could get it, and declared that paraldehyde, nauseous drug though it is, was the only thing worth living for. Rarely will it be necessary to force sleep by the powerful combination of morphia and hyoscine, or chloroform administration, but in extremely obstinate cases of maniacal excitement or in agitated melancholia it may be necessary to resort to such extreme measures. Continual warm baths have a very valuable effect in calming such excitement and provoking sleep, but are difficult to administer except in institutions, with relays of nurses.

Sometimes nervous irritability to the slightest noise may be cured by forcing the patient to endure the racket of a noisy street outside. For a week or ten days sleep may be hardly procurable, yet afterwards the irritability to noises disappears, and sleep is normal.

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But there are two ways in which this end may be obtained according to the necessities of the patient: the first is the abduction and plaster fixation method of Whitman, and the other procedure consists of abduction and suspension with traction.

1. *Abduction and Fixation in Plaster of Paris.*—This is a method introduced by Royal Whitman, who has done so much to advance the surgery of the hip-joint.

The patient is anesthetized and placed on a pelvic rest attached to a firm table—failing such a rest, an inverted bowl of sufficient height will do—and placed under the sacrum. The shoulders are supported on a padded box leaving the greater part of the trunk and thorax free and unsupported. An assistant abducts the sound limb to its full range; this helps to fix the pelvis. The operator grasps the injured limb, flexes the thigh to disengage the fragments and a second assistant extends the limb and exerts powerful traction until the shortening is abolished, then internally rotates the limb and abducts to its normal limit as indicated by the abducted sound extremity which acts as a control. During this time the operator lifts the thigh from beneath. While the two limbs are thus held by the assistants the body and injured extremity is bandaged in sheet wadding from the armpits to the toes, bony points being well padded. Plaster of Paris bandages are then applied from the toes to the axillæ; at the end the plaster is cut away on the injured side from just above the iliac crest to the axilla, but is left intact on the opposite side. The sound limb is not enclosed in plaster. The reduction and fixation of the fracture is thus maintained with the limb abducted and rotated inwards. The prolongation of the plaster upwards towards the axilla of the sound side prevents the patient from attempting to reduce the abduction.

The change in the patient after the plaster is applied is often remarkable. Pain disappears and he quickly adapts himself to what restraint the casing imposes. His mobility is incomparably greater than when nursed with a Liston splint bandaged to his side. At first he is nursed alternately on his dorsal or ventral aspect to avoid undue pressure on any one part, and later the head of the bed can be raised and the patient propped up. Furthermore, the patient can be carried out into the open air when the weather permits. The plaster is left on for eight to twelve weeks, but after six weeks the casing may be removed from the knee downwards to permit of movements to the knee and

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rotation of the limb should help in deciding the cause of symptoms. It need hardly be said that once the idea of a fracture suggests itself a radiograph is of supreme importance, both as a help in diagnosis and as a guide to treatment. Indeed, any injury of the hip followed by persisting pain and disability should be treated as for a fracture until a radiograph is available.

The ultimate issue of a fractured neck of the femur is often regarded unfavourably, and a fibrous union is too frequently assumed as the best that can be expected. There are undoubtedly factors tending towards non-union, such as the diminished vitality of the femoral head, which is often dependent for its blood supply upon the few surviving fibrous filaments that still tether it to surrounding structures. Rarefaction of bone in the area of fracture and the flow of synovial fluid between the separated fragments are other causes favouring non-union. But the most decisive factors are the lack of good apposition between the broken ends of bone and defective immobilization permitting continual movement between the segments. Where there is good reduction and continuous fixation of the fracture, bony union much more frequently ensues. Until recently, however, the accepted method of treating fracture of the neck of the femur was that introduced long ago by Liston, namely, the tying of a long wooden splint to the trunk and affected limb. And in spite of the true nature of the fracture, as revealed by radiograms, the departure from the traditional way of treatment has been somewhat slow. The upper fragment is small, abducted and uncontrollable, and it is therefore necessary in any method of reduction and final fixation to bring the lower segment into alignment with the upper, and this can be done only by keeping the limb abducted. The straight wooden side splint permits of no abduction.

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ankle. When the plaster is cut away entirely the patient remains in bed for another fourteen days during which massage is administered and voluntary movements encouraged. He then gets on his feet gradually in a walking calliper provided with a controllable joint at the knee so that when standing and walking the knee-lock can be fixed in extension and flexed when the patient desires to sit. At first a pair of crutches will be necessary, but soon he will be able to get about with a walking stick. The calliper should be worn for six months or more to relieve bodyweight and allow firm consolidation of the fracture to take place.

With regard to impacted fractures, the treatment is the same—namely, abduction and internal rotation in plaster. No reliance should be laid upon impaction, for it is found that impacted fractures in old people, even when lying in bed, are apt to loosen, and this is particularly the case in intracapsular fractures. It should be mentioned, however, that Cotton and Willis Campbell deliberately aim at impaction. When the shortening has been corrected and the limb held in internal rotation and abduction, a large pad of felt is placed over the great trochanter and a firm follow-through blow is delivered upon the trochanter by means of a heavy wooden mallet. After this procedure the limb does not roll out so loosely as before, due to interlocking of the fragments; the plaster is then applied with the limb in the position already described. The plaster abduction method is distinctly the best and most reliable means of treating fracture of the neck of the femur, and is applicable to all ages. Campbell has treated 205 elderly patients in this way with only ten deaths, and many people over eighty years of age have been so treated.

2. *Abduction with Traction and Suspension.*—If for any reason a plaster of Paris cast cannot be applied,

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as in people who are too decrepit, or whose body-girth is too great to permit of a comfortably moulded plaster, then the best treatment is to suspend the limb in a Thomas's splint. Extension strapping with cords is attached to the thigh and leg.

The patient is anesthetized, the shortening is corrected and the limb pulled down in the splint by tying the cords to the cross-bar below. The splint is suspended in abduction and another single cord, attached to the cross-bar, and passing over a pulley to a weight, keeps up the extension. In order to steady the pelvis and maintain sure abduction of the injured thigh, it is well to keep the sound limb also abducted in a suspended Thomas's splint; or, if preferred, a Liston long splint may be bandaged to the sound side instead. Counter-extension can be obtained by lifting the foot of the bed on blocks, but if this is done chest symptoms should be carefully watched for, and if there is any sign of embarrassment the blocks should be discarded.

The after-care is much the same as in the former procedure. But the traction and abduction method does not immobilize the fracture in anything like the way that plaster succeeds in doing, nor does it extend the same general freedom of movement to the patient.

FRACTURE OF THE NECK OF THE FEMUR WITH NON-UNION.

Long-standing cases of non-union present considerable difficulty. The mode of treatment depends largely upon the symptoms, the age of the patient and the radiographic appearances of the femoral neck. The two main symptoms are pain and a limping gait due to a short limb. Again, if union be long delayed there is a great tendency towards absorption of the neck, and, speaking generally, this disposition increases with increasing age. In elderly people the small proximal segment becomes partially absorbed or deformed with associated arthritic changes in the joint. There are two main lines of treatment, one which consists in a direct reparative attack on the fracture, and the other which ignores the fracture and concentrates on the restoration of stability and comfort

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to the joint. Regarded broadly, the former is best adapted to people in the earlier decades of life, and the latter to the more elderly.

1. *Refreshing and Pegging Operation.*—A direct attack on the fracture is possible only where the neck is fairly well preserved. And although the bones may be well shaped, yet the shortening and consequent adaptation of the soft parts may offer considerable resistance to correction. Therefore, as a preliminary to operation, weight extension of the limb in abduction for two or three weeks is desirable. For exposing the fracture and inserting the graft Albee's technique is the best and is carried out as follows:—

An incision commencing just internal to the anterior superior iliac spine is carried downwards for 4 or 5 inches towards the inner border of the sartorius; this muscle and the rectus femoris are retracted outwards and the ilio-psoas inwards. The fracture is exposed and fibrous tissue between the fragments is removed and the bone surfaces freshened by a curette or osteotome. Traction in abduction is then applied to bring the segments into good apposition and a second incision is made just above the great trochanter and proceeding downwards on the outer surface of the femur for 3 or 4 inches. A hand drill is introduced into this last wound and driven through the trochanter and neck into the proximal segment. This serves the purpose of finding the proper direction for the graft. The hand drill is withdrawn and a motor drill introduced along its track. A graft of the required length is then taken from the crest of the tibia, and the edges rounded off and properly shaped. This is best done by introducing the graft into Albee's dowel-cutter, which is an exact counterpart of the motor drill. When the graft is ready the drill is withdrawn from the femur and the graft introduced, binding the two fragments in close apposition.

The limb is encased in plaster of Paris in abduction and the same after-care adopted as in the Whitman procedure already described; the only difference being the removal of the plaster at the end of two weeks to take out the stitches; a fresh plaster being reapplied.

2. *Whitman's Reconstruction Operation.*—The reconstruction operation introduced by Whitman is planned for ununited fracture of the neck of the femur where there is absorption of bone or little prospect of osseous

FRACTURE OF THE FEMUR

union by bone grafting owing to atrophic changes. In many fractures of this type the hip is unstable and painful, and insufficient relief is derived from wearing a calliper. The symptoms are so fatiguing that the patient is glad to reduce his walking to a minimum. The reconstruction operation gets rid of pain and provides a reliable and serviceable hip-joint with a convenient range of movement, sufficient for most purposes. In patients of fairly good vigour the operation is well tolerated. The essentials of the procedure are the removal of the head of the femur and the shifting of the great trochanter with its muscles, and reattaching it at a lower level on the outer side of the femur:—

The joint is approached through a skin incision which commences just behind the anterior superior iliac spine and proceeds vertically downwards and then curves backwards, crossing the shaft of the femur about three inches below the top of the great trochanter and ending a little behind the bone. The joint is opened between the tensor fascia femoris and the gluteus medius and the head of the femur is removed. An osteotome is then driven through the base of the great trochanter and the latter is drawn upwards with its attached muscles; the end of the bone is delivered, smoothed off with a file, and afterwards implanted into the acetabulum. The part from which the trochanter was removed becomes in effect a new neck of the femur and slips into the socket without difficulty when the limb is abducted about 25 degrees. A thin slice of bone is next shaved off the outer side of the shaft below the original site of the trochanter, and the latter is dragged down and fastened to this raw area by sutures, or, as the writer prefers, by a beef bone peg. Plaster of Paris is applied from above the pelvis to the toes with the limb in a moderate amount of abduction.

The plaster below the knee is removed at the end of four weeks to permit of movements to the knee and ankle, and the rest of the case is cut off four weeks later, after which the patient is kept in bed for another two weeks whilst massage is administered and voluntary movements, especially abduction, are encouraged. At the end of this time he is allowed up, first on two crutches with gradual weight bearing, and by degrees he is reduced to a walking stick and finally dispenses with artificial aid.

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to the joint. Regarded broadly, the former is best adapted to people in the earlier decades of life, and the latter to the more elderly.

1. *Refreshing and Pegging Operation.*—A direct attack on the fracture is possible only where the neck is fairly well preserved. And although the bones may be well shaped, yet the shortening and consequent adaptation of the soft parts may offer considerable resistance to correction. Therefore, as a preliminary to operation, weight extension of the limb in abduction for two or three weeks is desirable. For exposing the fracture and inserting the graft Albee's technique is the best and is carried out as follows:—

An incision commencing just internal to the anterior superior iliac spine is carried downwards for 4 or 5 inches towards the inner border of the sartorius; this muscle and the rectus femoris are retracted outwards and the ilio-psoas inwards. The fracture is exposed and fibrous tissue between the fragments is removed and the bone surfaces freshened by a curette or osteotome. Traction in abduction is then applied to bring the segments into good apposition and a second incision is made just above the great trochanter and proceeding downwards on the outer surface of the femur for 3 or 4 inches. A hand drill is introduced into this last wound and driven through the trochanter and neck into the proximal segment. This serves the purpose of finding the proper direction for the graft. The hand drill is withdrawn and a motor drill introduced along its track. A graft of the required length is then taken from the crest of the tibia, and the edges rounded off and properly shaped. This is best done by introducing the graft into Albee's dowel-cutter, which is an exact counterpart of the motor drill. When the graft is ready the drill is withdrawn from the femur and the graft introduced, binding the two fragments in close apposition.

The limb is encased in plaster of Paris in abduction and the same after-care adopted as in the Whitman procedure already described; the only difference being the removal of the plaster at the end of two weeks to take out the stitches; a fresh plaster being reapplied.

2. *Whitman's Reconstruction Operation.*—The reconstruction operation introduced by Whitman is planned for ununited fracture of the neck of the femur where there is absorption of bone or little prospect of osseous

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lipoid nephrosis, and such varieties of nephritis whose names are based on their morbid anatomy, as large white kidney, large red kidney, large mottled kidney and small white kidney, or secondarily contracted kidney. Lipoid nephrosis is a term introduced to imply a condition of disordered metabolism associated with renal degeneration. It is often thought to be synonymous with chronic parenchymatous nephritis. Clinically, there is a history of an insidious onset, in a young patient. The œdema tends to be severe, and the basal metabolic rate is low. The special characteristics of the blood and urine are described later (see p. 32).

(3) *Chronic Nephritis with slight or no Œdema.* (Azotæmic Nephritis.)—Included in this group are chronic interstitial nephritis, known also as small red kidney, red granular kidney, gouty kidney, arterio-sclerotic kidney, and senile or atheromatous kidney. There are frequently cardiovascular changes present, such as cardiac hypertrophy, arterio-sclerosis and supertension.

(4) *Mixed Types of 2 and 3.*—A patient who is classed in this group may show considerable œdema, with cardiovascular changes, and retention of nitrogen in the blood, as described later.

RENAL FUNCTION TESTS.

Those tests only will be described applicable to the majority of cases seen in general practice, and which are of considerable value, as will be pointed out later.

(1) *Examination of the Urine.*—The volume of urine passed by day and night should be collected and measured for two or three days in two specimens, i.e. from 8 a.m. to 10 p.m., and from 10 p.m. to 8 a.m. Normally about 37 oz. are passed by day and 13 oz. by night. In acute nephritis the total volume of urine is considerably reduced during the early stages. In chronic nephritis there is a tendency for the night

The Value of Modern Tests in Renal Disease.

By G. E. BEAUMONT, M.A., M.D., F.R.C.P., D.P.H.

Physician to Out-patients, the Middlesex Hospital; Physician to the Brompton Hospital, etc.

THE classification of nephritis has always been a matter of considerable difficulty, owing to the fact that the clinical diagnosis is not infrequently at variance with the condition of the kidneys, as shown at autopsy. This difficulty still remains so great, that for clinical purposes it is most satisfactory to adopt a simple clinical classification.

CLINICAL CLASSIFICATION OF NEPHRITIS.

(1) *Acute Nephritis*.—Three types may here be distinguished, according to the mode of onset of the disease. (a) *The hæmorrhagic type*: This was comparatively frequent during the Great War, and is met with in civil practice from time to time, especially in children. The first symptom noted is that the urine is very dark, and on examination it is found to contain blood, usually in large quantities. (b) *The toxæmic type*: Here the patient complains of various symptoms, such as headache, nausea, dyspnœa, pain in the back, and perhaps vomiting and diarrhœa. An initial soreness of throat may have occurred. (c) *The exudative type*: The patient notices that he is swelling, either in the legs, face, body, arms, or generally.

(2) *Chronic Nephritis with Œdema*. (Hydræmic Nephritis).—In this group we include subacute nephritis, in which there is usually a history of acute nephritis, the patient now showing œdema with albuminuria. It also comprises chronic parenchymatous nephritis,

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lipoid nephrosis, and such varieties of nephritis whose names are based on their morbid anatomy, as large white kidney, large red kidney, large mottled kidney and small white kidney, or secondarily contracted kidney. Lipoid nephrosis is a term introduced to imply a condition of disordered metabolism associated with renal degeneration. It is often thought to be synonymous with chronic parenchymatous nephritis. Clinically, there is a history of an insidious onset, in a young patient. The œdema tends to be severe, and the basal metabolic rate is low. The special characteristics of the blood and urine are described later (see p. 32).

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volume to increase. The specific gravity of the day and night specimens should also be determined. Normally it is about 1,018 by day and 1,026 by night. In chronic nephritis there is a tendency for the specific gravity to fall, and "fixation" may occur, so that the specific gravity does not rise at night. Protein should be tested for in the day and night specimens, and the urine may be sent to a laboratory for the determination of the relative amounts of albumin and globulin. If albumin is present in the day specimen and absent from the night one it is suggestive of a functional albuminuria. In nephritis there may be 6 parts of albumin to 1 part of globulin, whereas in functional proteinuria only 1 part of albumin may be found to every 2 parts of globulin. The urine should also be examined microscopically for casts, cells, crystals and organisms. In this way an albuminuria resulting from a mild degree of cystitis would not immediately be diagnosed as due to nephritis. The presence of organisms with bladder epithelial cells and pus cells, and the absence of casts and renal epithelial cells, would give the clue to the diagnosis.

(2) *Examination of the Blood.*—This can easily be carried out in general practice if the patient is willing to submit to vein puncture. It should always be urged, as very important results are obtainable. Six to eight cubic centimetres of blood are withdrawn from a vein in the arm with a needle and syringe, and the blood is immediately placed in a small glass tube containing a pinch of potassium oxalate crystals to prevent clotting. The specimen is then sent to the laboratory for analysis. The normal figures are as follows :—

Urea	-	-	-	-	20-40	mg.	per	100	c.cm.
Non-protein nitrogen	-	-	-	-	20-40	"	"	"	"
Creatinin	-	-	-	-	1-1.5	"	"	"	"
Uric acid	-	-	-	-	2-3.5	"	"	"	"
Cholesterol	-	-	-	-	150	"	"	"	"
Chlorides	-	-	-	-	500	"	"	"	"

TESTS IN RENAL DISEASE

In hydræmic nephritis there is usually an increase in the blood chlorides or cholesterol. In azotæmic nephritis an increase occurs in the urea, non-protein nitrogen, creatinin and uric acid. In acute nephritis there is often nitrogen retention in the early stages.

(3) *Elimination of Natural Substances.*—(a) *Water* : The patient empties his bladder first thing in the morning and then drinks a pint of water. Nothing more is taken by mouth until the test is completed. The urine is collected every hour for three hours. In health, a pint of urine should be evacuated in this time, but in nephritis the amount may be reduced. (b) *Urea* : This test is performed as for the water test, but after emptying the bladder the patient drinks 15 grams of urea dissolved in about 3 oz. of water and flavoured with orange. The urine is passed at the end of one and of two hours, and sent to the laboratory to be measured and have the urea content determined. Normally, the first-hour specimen contains 1·5 per cent., and the second over 2 per cent. of urea. With deficient renal function lower figures may be obtained. Diuresis produced by the urea often accounts for the low figure in the first specimen.

(4) *Excretion of Dyes.*—These tests are chiefly of value in surgical cases in which the function of each kidney has to be determined separately. 0·1 gram of indigo carmine is injected intramuscularly after cystoscopy, and the dye should be seen exuding from the orifice of each ureter in about six minutes. If there is deficient renal function on either side, there is delay in elimination of the dye.

THE CLINICAL VALUE OF RENAL FUNCTION TESTS.

We can now profitably consider the clinical value of the renal function tests described. There is no doubt

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TESTS IN RENAL DISEASE

(2) *Determination of the Severity of the Nephritis.*

The urine : Large amounts of protein, up to 10 per cent., usually indicate severe and acute nephritis. Protein present only in the day specimens, or after strenuous exercise, suggests a functional condition. A relative increase of globulin is also indicative of functional proteinuria. Blood usually points to acute or subacute nephritis. *Blood chemistry* : The nitrogen is said not to rise unless three-quarters of the total renal tissue is damaged. The severity of the nephritis is roughly proportional to the blood urea and non-protein nitrogen figures, provided that other causes of nitrogen retention are excluded, such as urinary or intestinal obstruction. Thus, an enlarged prostate interfering with complete evacuation of the bladder will cause nitrogen retention in the blood. The severity of a lipid nephrosis is probably roughly proportional to the degree of cholesterol retention. *Urea concentration test* : Low figures are usually found when there is much renal damage. There is, however, a fallacy in the test, as the rate of urea absorption depends upon the speed at which the stomach empties. Thus, a variable factor is introduced.

(3) *Determination of the Prognosis in Nephritis.*

Blood chemistry : If the blood urea figure is over 400 mgs. per 100 c.cm., death is almost inevitable in a short time. With a figure of 300 the patient may live for a considerable while. If the creatinin is above 7 mgs. per 100 c.cm., the case may be regarded as hopeless.

(4) *Determination of and Control of Treatment in Nephritis.*

As renal function tests materially assist in the diagnosis of the type of nephritis, they also indicate the

that great help is obtainable in many cases in the following ways :—

(1) *Determination of the Type of Nephritis.*

(a) *Acute nephritis.* *The urine:* The volume is reduced, but its specific gravity is increased. There is abundant protein; hyaline, blood or epithelial casts may be found, with red and white blood corpuscles. *Blood chemistry:* The urea and non-protein nitrogen figures are usually raised during the early stages.

(b) *Hydræmic nephritis.* *In subacute nephritis.* *The urine:* The volume is reduced, specific gravity raised, protein is moderate or abundant, and there are usually some granular casts and red corpuscles present. *Blood chemistry:* There may be some nitrogen retention, but usually the cholesterol is normal. *In chronic parenchymatous nephritis or lipoid nephrosis.* *The urine:* The volume is diminished, specific gravity raised, and protein occurs in fair quantities. There are some casts, fatty, hyaline or epithelial, and some leucocytes, but no red corpuscles. *Blood chemistry:* The cholesterol is increased to 300 or 500 mgs. per 100 c.cm. The chlorides may be slightly increased. The blood nitrogen is not usually raised except in the terminal stages of the disease.

(c) *Azotæmic nephritis.* *The urine:* The volume is increased, especially by night. The specific gravity is low by day and night. The protein is scanty and occasional hyaline casts may be found. *Blood chemistry:* The urea, non-protein nitrogen and creatinin may be raised. The chlorides and cholesterol are usually normal.

(d) *Mixed types.* *The urine:* Protein is found in moderate amounts, and a few granular or epithelial casts may be present. *Blood chemistry:* There may be retention of nitrogen and also of chlorides and cholesterol.

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(4) *Determination of and Control of Treatment in Nephritis.*

As renal function tests materially assist in the diagnosis of the type of nephritis, they also indicate the

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kind of treatment required in any case.

In acute nephritis the patient should be given a moderate fluid and low protein diet. The ordinary "milk" diet should be avoided, consisting of milk 2 pints, egg 1, rice (dry) 3 oz., and bread 10 oz. This contains 70 grams of protein, which are practically sufficient for an adult on an ordinary diet, in health. The following diet may be given: *Days 1-3.* The total fluid should not exceed 3 pints in 24 hours. Water, barley water, imperial drink, and glucose orangeade (8 oz. glucose in $\frac{1}{2}$ pint water, flavoured with the juice of an orange) may be given, but no solid food. *Days 4-5.* After diuresis has occurred, or when the blood in the urine has lessened, the diet may be increased as follows: milk $\frac{1}{2}$ -1 pint, glucose orangeade 2 pints, a little coffee, thin bread and butter, Bengers' food, cream $\frac{1}{2}$ oz., sugar and weak tea. *After 7 days.* Two pints of milk may now be given, with bread and milk, sugar, toast, bread and butter, honey, cream and potatoes. Later can be added milk pudding, suet pudding, porridge, bananas, steamed fish, chicken, boiled lamb and one egg a week.

In Hydræmic Nephritis. (a) *In subacute nephritis*, in which there is persistent œdema, a salt-free diet may be tried. The Karrell diet is as follows: *Days 1-7.* Milk 8 oz. at 8 a.m., 12 noon, 4 p.m. and 8 p.m. *Day 8.* Add at 10 a.m. one lightly boiled egg and a slice of toast. *Day 9.* Add 2 oz. vegetables, as asparagus, celery, cauliflower or carrots, and 2 teaspoonfuls of starch to the mid-day milk feed to form a vegetable soup. Give also one slice of toast at 4.30 p.m. *Days 10-12.* Add 1 egg and 1 oz. rice, weighed dry.

(b) *In lipoid nephrosis* an Epstein high protein and low fat diet may be given. This should contain protein 120-240 grams, carbohydrate 150-300 grams and fat 20-40 grams. The total fluid should be between

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40 and 50 oz. The diet can be arranged as follows :—

		GRAMS.			CALS.
		Prot.	Fat.	Carb.	
BREAKFAST :					
Fish (white)	6 oz.	30	0	0	120
Oatmeal (dry)	1 oz.	4.6	2	18	108
Ham (lean)	2 oz.	12	6	0	102
Milk (skimmed)	10 oz.	10	0	10	80
Bread	2 oz.	4	0.8	28.6	138
Marmalade	$\frac{1}{2}$ oz.	0	0	9	36
Tea	$\frac{5}{8}$ oz.	0	0	0	0
LUNCH :					
Meat (lean)	4 oz.	24	12	0	204
Peas or lentils	2 oz.	4	0	8	48
Rice (dry)	1 oz.	1.6	0.1	22.7	98
Milk (skimmed)	10 oz.	10	0	10	80
Potato	2 oz.	2	0	12	56
TEA :					
Bread	2 oz.	4	0.8	28.6	138
Apple	4.5 oz.	0	0	18	72
Tea	5 oz.	0	0	0	0
Milk (skimmed)	1 oz.	1	0	1	8
DINNER :					
Fish (white)	4 oz.	20	0	0	80
Meat (lean)	4 oz.	24	12	0	204
Peas or beans	2 oz.	4	0	8	48
Toast	2 oz.	4	0	40	176
Rice (dry)	1 oz.	1.6	0.1	22.7	98
Milk (skimmed)	10 oz.	10	0	10	80
Coffee	4 oz.	0	0	0	0
		170.8	33.8	246.6	1,974

In addition, thyroid extract should be given in large doses (15 or 20 grains daily) as long as the blood cholesterol remains raised. If the blood analysis shows there is marked nitrogen as well as cholesterol retention, then the high protein diet is contraindicated.

(c) *In azotæmic nephritis*, a moderate nitrogen diet is required, containing about $\frac{1}{2}$ gram of protein per 1 pound of body weight, which is equivalent to 70 grams of protein for a man weighing 10 stones.

The Prognosis in Mastoid Disease.

By E. WATSON-WILLIAMS, M.C., CH.M., F.R.C.S.E.

Surgeon-in-Charge, Ear, Nose and Throat Department, Bristol Royal Infirmary.

IN a condition so protean as mastoid disease, prognosis manifestly depends on a multitude of factors. The age and condition of the patient, the severity and extent of the disease, the possibility of serious complications, and, by no means least, the time and manner of treatment, must all be considered. Since fortunately the great majority of patients recover after operation, we have to discuss not only the immediate risks but also the ultimate prospect as regards otorrhœa, hearing and general comfort.

In an endeavour to estimate the results, and particularly the late results, a survey has been made of a consecutive series of 250 patients on whom I have performed a mastoid operation; in 9 both ears were so treated, so that 259 ears or "cases" are included. A distinction has been kept between primary "acute" disease, acute exacerbation in the course of chronic otitis ("chronic-acute"), and "chronic" disease with no urgent features—in the majority of the latter some measure of activity was present, but only those are classified "chronic-acute" in which the operation was performed as a matter of urgency. Though the series is not large, it is uniform, being the work of one operator. In this article in *THE PRACTITIONER* it is proposed briefly to discuss the complications and other factors that appear to affect the prognosis, and to indicate the latter mainly by a statement of the results obtained. Table I shows the distribution of cases.

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TABLE I.

Number of cases at successive ages.

Operation.	Schwartz.		Heath.	Radical.		Total.	Cases per Year of Age.
Type.	Acute.	Chronic-Acute.	Chronic.	Chronic-Acute.	Chronic.		
Age Under 1	9	2				11	11
1—4	12 <i>d</i>	5		3 <i>ll</i> <i>aa</i>	2	33	6.6
5—9	20 <i>ll</i> <i>d</i>	11 <i>l</i> <i>d</i>	1 <i>b</i>	2 <i>l</i>	3	37	7.4
10—14	17 <i>lll</i>	12 <i>lc</i>		3 <i>l</i>	4	36	7.2
15—19	8 <i>l</i> <i>d</i>	8 <i>l</i>	4 <i>b</i>	5 <i>l</i>	12 <i>l</i>	37	7.4
20—29	4	3	4	9 <i>ad</i>	15	35	3.5
30—39	1	3 <i>t</i>		4	3	11	1.1
40—49	1	2		3 <i>l</i>	6	12	1.2
50—59	1	1 <i>l</i> <i>d</i>		1 <i>l</i>	3	6	0.6
Special*		2 <i>cc</i>	2	4 <i>lld</i>	44	52	
	73	49	11	34	92	259	

* Patients at a hospital for adult males only.

- (a) one case acute. (d) death.
 (b) one case chronic-acute. (l) labyrinthectomy.
 (c) one case chronic. (t) sinus thrombosis.

Acute cases - 76; deaths 3 = 4 per cent.
 Chronic-acute cases 79; " 4 = 5 per cent.
 Chronic cases - 104; " 0

For the purpose of showing the distribution of mastoid disease 52 cases (48 chronic) at a special hospital for adult males have been separately placed; the area from which they were drawn was not the same as that providing the rest, and in most of them war service was an etiological factor. Among the remainder the two sexes and the two sides of the body were affected equally. From Table I we see clearly how much mastoid disease is an affection of early life. (Owing to the existence of a local hospital for children, the disproportion is minimized.) The first two decades provide 144 out of 207 cases (70 per cent.), and 7.2 cases at each

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year of life; while the 30 years 30-59 have only 28 cases. Of 76 primary acute cases, 68 occurred in the former period, against 3 in the latter. *More patients required a mastoid operation in the first year of life than at any subsequent age.*

The general nature of the series of cases is indicated by the high proportion of acute cases (60 per cent.), and of serious pre-operative complications. One patient died from pulmonary complications (q.v.) following operation; this represents the entire "operative mortality" of the series. Six patients died from the effects of complications present before operation. One child had broncho-pneumonia; an adult came with cerebral abscess and meningitis; four patients died from the sequelæ of sigmoid sinus thrombosis. Table I indicates the close association. These six cases illustrate the point that the mortality of mastoid disease is largely due to delay, and therefore avoidable. Four of the six certainly should have been operated on much earlier. The view is still too widely current that post-aural swelling is a reliable guide to exclude mastoiditis—a dangerous fallacy. Reliance cannot even be placed on the absence of aural discharge; among the 68 acute cases in children in the series, 4 had apparently completely normal tympanic membranes; sinus thrombosis was found in 2 of the latter.

COMPLICATIONS.

Sigmoid Sinus Thrombosis.—Thrombosis of the sigmoid sinus was found at operation in 11 cases, and of the jugular bulb in two more. The Schwartze operation was performed in 11 (6 acute, 5 chronic-acute), 1 adult subsequently requiring the radical operation; the radical operation was performed for two patients (chronic-acute). Of the 13, 4 died. One aged 54 had had serious symptoms for two months; she developed cavernous sinus thrombosis the day after operation,

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and died on the fourth day. A second (16) had had serious symptoms for twenty-two days; bronchopneumonia supervened, and she died with multiple lung abscesses on the thirty-fourth day. A third had had rigors for five days before operation; the sequel was similar to the last, and she died on the sixteenth day. A fourth (boy) died apparently of acute toxæmia on the fifth day after operation. A fifth developed a patch of pneumonia, but recovered. A sixth survived, although for a time streptococci and staphylococcus albus grew from his blood. The 3 patients who had radical operations have satisfactory cavities; the 6 survivors of the Schwartze operation have dry ears and good hearing. In this series sigmoid sinus thrombosis is the most frequent and the most fatal of the serious complications of mastoiditis, and the only fatal complication of primary acute disease. If survived, it has no prejudicial effect on the ultimate result. The last observation applies also to peri-sinus abscess (5 acute, 4 chronic-acute), and to extra-dural abscess (4 chronic-acute).

Acute Diffuse Suppurative Labyrinthitis.—This condition was present before operation in 7 cases (1 acute, 6 chronic-acute), of whom 2 had, in addition, suppurative meningitis, and a third a meningeal reaction. An eighth patient developed labyrinthitis after the Heath operation. After radical operation and labyrinthectomy all have dry cavities and one fair hearing.

Diffuse "Serous" Labyrinthitis.—This was diagnosed in 3 cases (2 chronic-acute, 1 chronic), of which 1 had a fistula also; the labyrinth being insensible to stimulation. After the radical operation all have clean cavities, but the chronic case did not recover labyrinthine sensibility.

Circumscribed Peri-labyrinthitis with Fistula.—A fistula

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of the external semicircular canal was found during the radical operation eight times (1 chronic-acute, 7 chronic), 1 being treated by labyrinthectomy. In 5 patients Bárány's test had been positive before operation. Two of the 8 had had operations elsewhere (1 Schwartz, 1 radical). At present 4 have occasional moisture, 1 otorrhœa, 1 is untraced; only 2 have quite satisfactory cavities.

In this series diffuse labyrinthitis has led neither to a fatal nor even to a locally unfavourable result. Fistula, on the other hand, perhaps because it much increases the difficulties of a complete radical operation, seems to have considerable influence in impeding a good result.

Meningitis. — Four patients (chronic-acute) came under the writer's care suffering from suppurative meningitis. One had, in addition, a temporo-sphenoidal abscess, and died. One, in whom the meningitis followed removal of an aural polypus elsewhere, recovered after repeated drainage of the meninges through the internal auditory meatus. A third recovered after labyrinthectomy and drainage of a saccus endolymphaticus abscess. The fourth, a boy of eight, had a large cholesteatoma of the Eustachian tube; meningitis followed a box on the ear; he recovered after the radical operation and drainage. The 3 survivors have completely dry cavities.

During the period under review a radical operation was performed on 5 patients not included in the series. In 1 tuberculous meningitis, in 3 pneumococcal meningitis (apparently not otogenous), and in the fifth a glioma of the corpus callosum had produced symptoms of intracranial disorder that seemed possibly attributable to otitis media. I regard it as highly important that similar cases should be submitted to operation early; to wait until the diagnosis is clear

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will be to miss the favourable opportunity for intervention in remediable cases.

Facial Paralysis.—Facial paralysis had been long present in 2 cases before radical operation: 1 chronic-acute, paralysis followed previous radical operation elsewhere; 1 chronic, paralysis followed "curetting" elsewhere. In both it is permanent. Recent facial paralysis preceded operation in 3 cases (2 acute, Schwartze; 1 chronic-acute, radical). All recovered completely. Facial paresis followed operation in 8 of the 9 patients requiring labyrinthectomy. In 1, where the meninges were drained through the internal auditory meatus, it is permanent, the others have all recovered. Transitory facial weakness followed the radical operation in 2 cases. In a third patient, who had been "curetted" a few months previously elsewhere, a large fragment of temporal bone came away during the radical operation, exposing the nerve and producing almost complete and permanent paralysis.

Tuberculous Otitis.—Three children had the Schwartze operation, and were subsequently found to be suffering from tuberculous otitis. One has a fistula, and requires further operation, a second appears cured by a second Schwartze operation with primary closure, the third after a radical operation has a clean dry cavity and good hearing.

Pulmonary Complications.—One child while convalescent from broncho-pneumonia required a Schwartze operation (successful). A second developed mastoid disease early in the course of broncho-pneumonia; a Schwartze operation relieved the former, the ear having nearly healed, when fourteen days later the patient died of the lung disease; no doubt the general anæsthetic was a factor in determining this issue, but local anæsthesia is not suitable for the young. The

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patients represent 24 "cases" (9 per cent. of 259). All 7 Schwartz operations gave good results; treated nasal sinus disease appears not to affect the late result of this operation. Of the 17 radical operations, only 11 have produced completely dry cavities (65 per cent.); the presence of nasal sinus disease seems a possible impediment to a good result after the radical operation.

Atrophic Rhinitis.—Three patients with atrophic rhinitis had Schwartz operations, all successful. A fourth had a radical, the cavity remaining moist.

Contralateral Otitis.—When, in addition to mastoid disease on one side, the opposite ear is unhealthy, this factor may modify our line of treatment. A record was obtained of the condition of the opposite ear in 181 patients. I performed the Schwartz operation on both sides in 3 patients (acute); all 6 ears are dry, with good hearing. One adult with chronic disease desired a double Schwartz operation (Schwartz on one side previously elsewhere); although not considered suitable, this was done, but the improvement was only temporary. Four patients on whom the Schwartz operation was done have chronic suppuration of the other ear; 16 more have healed otitis, 14 with good hearing. Of the above cases, 17 have both ears dry, 5 have bilateral otorrhœa; some factor equally affecting both ears would seem probable.

I performed a Schwartz operation on one side, and a radical on the other in two cases, one with meningitis requiring labyrinthectomy (sacculus endolymphaticus abscess). In a third patient a Heath operation was done on one side, and a radical on the other. The two Schwartz operations and the labyrinthectomy have resulted in dry ears. One patient on whom a Heath operation was done had had a Schwartz on the other side elsewhere, and two more have healed otitis media. A radical operation was performed on both sides in two

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pulmonary sequelæ of sinus thrombosis are dealt with under that head.

At a special hospital for adult males 1 patient (chronic) developed bronchitis immediately after a radical operation. A second (chronic) had broncho-pneumonia; both recovered. A chronic-acute case, after the radical operation, developed broncho-pneumonia, leading to lung abscess and empyæma; in spite of several operations he died, the ear having healed. These were the only definite pulmonary sequelæ in the series, and the last is the only fatality apart from those due to complications present before operation.

ASSOCIATED CONDITIONS.

Adenoids.—Out of 75 children on whom a Schwartz operation was performed, 59 (including 7 under one year old) were found to have adenoids at the time (=79 per cent.); in 8 only of these was the mass small. No adenoids were present in 15, including one tuberculous baby; 8 of these had had adenoids removed within the previous year, and in one case this seemed to have caused exacerbation in an old otitis. In a sixteenth case an incomplete adenectomy (elsewhere) a week earlier was clearly the cause of the mastoid disease. An adenoid curette is an essential part of the equipment for the Schwartz operation. Two children on whom a radical operation was done required removal of adenoids before the cavity became healthy.

Nasal Sinus Disease.—Of the 250 patients fewer than 100 were examined. No less than 20 were found to have gross sinus disease. Four patients had a Schwartz operation, a fifth a Schwartz on each side, a sixth a Schwartz on one side and a radical on the other, 12 had a radical operation and 2 a radical on each side. Nasal sinus disease was thus associated with 4 out of 9 patients who required bilateral operations; the 20

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LOCAL ANÆSTHESIA.

Two patients suffered from severe acute nephritis sufficiently serious to negative a general anæsthetic. In each case it appeared to be secondary to the mastoid disease and disappeared after operation. For the latter, local anæsthesia by means of novocaine infiltration was employed and was fairly, but not entirely, satisfactory in each case (1 Schwartz, 1 radical). A third patient was submitted to the radical operation under local anæsthesia on account of severe cardiac disease. The result of the Schwartz operation is very good; the radical cavity of the nephritic subject is well healed, that of the last patient remains moist.

RESULTS.

During 1928 an attempt has been made to examine every patient in the series. A questionnaire was sent out in addition asking, among other points:—

(1) Is the ear dry and comfortable? If not, what is the matter?

(2) Is the hearing in it good, fair, poor or none?

(3) Have you had any subsequent operation?

(4) Is the opposite ear deaf or running?

My thanks are due to those colleagues who kindly furnished reports on patients who could not attend. The unexpected features revealed by this examination were the almost uniformly good results attending operation for primary acute mastoid disease, and the number of patients who after the radical operation had useful hearing. The late results after the Schwartz operation are summarized in Table II.

From Table II we see that in primary acute otitis the ear after a Schwartz operation became dry and remains dry in 62 out of 63 cases (98 per cent.), 56 patients (89 per cent.) have good, i.e. apparently normal, hearing, while excepting one elderly adult

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patients, 1 having had a previous double radical. Two patients for whom the writer did a radical operation had had a radical operation, and a third a Schwartz, on the opposite side. Sixteen other radical patients have continuing suppuration of the opposite ear; in 13 the operation resulted in a dry cavity—the conditions maintaining suppuration in the opposite ear seem not to affect the result of the radical operation. Twenty more had healed otitis of the other side, 8 being more or less deaf.

Thus in addition to the 9 patients on whom I operated on both sides, 62 had had suppuration of the ear opposite to that operated, a total of 71 out of 181 (40 per cent.). Disease of the opposite ear is common. It may cause hesitation in advising a radical operation, but should encourage an early resort to the Schwartz when indicated.

EFFECT OF SKIN GRAFT.

A skin graft at the end of a radical operation adds materially to the patient's comfort, diminishes the time spent in hospital and the frequency of dressings; it seems often not to decrease the time from operation to complete healing. It was thought inadvisable to employ it in 53 cases, owing to severity of infection (24), large size of cavity, exposure of facial canal, fistula, or labyrinth (17), or on account of youth of the patient or employment of local anæsthesia. The late results show:—

		Dry	Moist	Otorrhœa	Total
Grafted	- -	59 (84%)	8	4	71
Not grafted	- -	41 (82%)	6	3	50

The distribution of patients with good and fair hearing was exactly the same in proportion in the two classes. Employment of a skin graft appears to have no influence at all on the final result of the radical operation.

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educated or agitated parents giving little or no useful information; an occasional error of judgment in these circumstances may be forgiven the most experienced. But since the prospects are so relatively good, even with chronic disease, we should, at first, especially in children, refrain from more extensive operative measures unless they are quite clearly indicated.

Schwartz Operation and Primary Closure.—The advantages claimed for this method are:—

(a) A shorter stay in hospital; in this series, however, the average stay was 18 days as compared with 16 days in similar cases treated with drainage.

(b) Absence of subsequent dressings; this is not so great a gain as would at first sight appear. The “dressing” needed for an uncomplicated Schwartz case after the first fortnight is of the simplest description—in fact, the simpler the dressing, the better the result.

Eight cases (7 children) of recent acute suppuration with mild general symptoms were treated by suture of the wound at the time of the Schwartz operation. In all the bone disease appeared to be early and limited, and was thought at operation to have been completely eradicated. All gave a very satisfactory immediate result. In 2 it was found subsequently that the otitis was not primary but recurrent.

Reviewed after an average period of 2·9 years, only two children were found to have a dry ear with good hearing. A third child and the one adult have discharging and deaf ears. In the 4 remaining cases a second Schwartz operation became necessary after an average period of 1·5 years (author's 2). *A priori*, it appears illogical to perform the Schwartz operation, one of the primary objects of which is to drain the middle ear, and immediately to close the wound to avoid drainage. This method has now been abandoned. In the further case of one child, suppuration (subsequently proved

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TABLE II.

Late results of Schwartze operation.

Type of Disease.	Acute.	Chronic-Acute.	—
Ear dry, hearing good -	56	31	87
" " fair -	6*	2	8
" " poor -		3	3
	<u>62</u>	<u>36</u>	<u>98</u>
Ear runs, hearing fair -	1	1	2
" " poor -		1	1
Stay in hospital†, days -	16·0	18·4	
Average period of observation, years -	2·4	2·3	
Subsequent operation -		5	5
At an average interval of years		0·8	
	<u>63</u>	<u>43</u>	<u>106</u>

* *In one adult, variable.*

† *Uncomplicated cases.*

3 tuberculous and 3 chronic cases are not included.

1 patient untraced; 4 died.

whose hearing is often poor, all the patients have at least fair hearing in the operated ear. In early otitis media the prospect of good hearing and a dry ear is certainly no worse after a Schwartze operation than where conservative measures are suitable, and is possibly even better.

Where an acute exacerbation has occurred in the course of chronic disease the results, though good, are not so extremely gratifying. Out of 43, 36 have dry ears (83 per cent., exactly the proportion after radical operation), 31 have good hearing (72 per cent.), and 3 more have fair. As far as the survivors are concerned, many of them seem to be materially better off as a result of the acute mastoiditis, treatment of which has relieved the chronic otorrhœa and restored a healthy and functioning ear. Five patients, however, required further operative treatment (12 per cent.; Schwartze 2, Heath 1, radical 2). The decision as to the actual type of operation has often to be made during its course, the patient having been first seen only a short time before, and unobservant, ill-

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Eight cases (7 children) of recent acute suppuration with mild general symptoms were treated by suture of the wound at the time of the Schwartz operation. In all the bone disease appeared to be early and limited, and was thought at operation to have been completely eradicated. All gave a very satisfactory immediate result. In 2 it was found subsequently that the otitis was not primary but recurrent.

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to be tuberculous), having recurred after the writer's Schwartz operation, this method, with primary suture, has been employed with so far (1·8 years) a successful result.

Note.—In 6 other cases included in this article (Schwartz 4, Heath 1, radical 1), a Schwartz operation with primary closure had been done elsewhere.

Heath's Operation.—Where bone disease is confined to the mastoid process (and especially in children), one may expect a good result from the Schwartz operation. Where the walls or contents of the tympanic cavity are involved a radical operation is indicated. But in certain cases of chronic mastoid disease with good hearing, or when the opposite ear is deaf, Heath's operation appears the method of choice. It was performed in 11 such cases in this series—10 adults, in 2 of whom a Schwartz had been previously done (one by the writer). The results are as follows :—

Ear dry : hearing good or fair	-	-	2*
Otorrhœa†: hearing good or fair	-	-	5*
Otorrhœa: hearing poor	-	-	3
Average observation : 2·1 years.			

* *Opposite ear deaf in 1 case.* † *Occasional in 3.*

The child had a radical operation subsequently elsewhere. In a twelfth patient a Schwartz operation with primary closure had been performed elsewhere; for an acute recurrence the writer performed Heath's operation, suppurative panlabyrinthitis developed next day and labyrinthectomy was necessary. In 5 additional cases, where a Schwartz operation had left a healed deep post-aural depression, a plastic manœuvre produced a final result similar to that of Heath's operation; they are classified under the Schwartz operation.

Results of the Radical Operation.—(a) *Healing.*—This operation was performed on 130 patients, on

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both sides in 2; in 9 cases a labyrinthectomy was carried out at the same time. One patient died from cerebral abscess and meningitis present before operation; another from pulmonary complications (q.v.) following operation—operative mortality 0·7 per cent. Two patients, in whom the ears healed, have since died of intercurrent disease, two and three years respectively after operation, and are included below. Nine who left hospital in a satisfactory condition have not been traced. The results for the remainder are as follows:—

Clean, dry cavity:

Acute	-	-	-	3
Chronic-acute	-	-	-	24
Chronic	-	-	-	73

100=83 per cent.

Slight or occasional moisture 14=11 per cent.

Otorrhœa - - - 7= 6 per cent.

Average period of observation: 2·5 years.

Slight or occasional moisture appears in most cases to be of Eustachian origin, the cavity itself being well healed. This class is swollen by the inclusion of 6 comparatively recent cases which will probably become completely dry in the course of time. From the practical point of view such moisture is of little moment, but one cannot properly claim an entirely successful result.

It would be wrong to omit reference to the very material gain in general health experienced by many patients, and relief of psychotic symptoms in not a few, in addition to the obvious local advantages of operative treatment.

(b) *Hearing*.—The matter of hearing after the radical operation is given second place to that of healing, for which the operation is primarily performed. All but 3 of the patients had chronic otitis, and the great majority had had no useful hearing for many years.

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Results of the Radical Operation.—(a) *Healing.*—This operation was performed on 130 patients, on

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it does not reach the "fair" standard.

Hearing good	-	-	-	9=8	per cent.
Hearing fair	-	-	-	14=12	per cent.
Hearing less than fair	-	-	-	96=80	per cent.

CONCLUSIONS.

(1) Primary mastoid disease is an affection especially of early life and not rare even in nurslings.

(2) The mortality of mastoid disease is largely due to delay in treatment, and therefore preventable. Sigmoid sinus thrombosis is the most frequent of fatal complications.

(3) The operative risk, apart from existing complications, is practically the risk of the anæsthetic.

(4) A dry ear and good or at least fair hearing should result from operation in almost every case of primary acute mastoid disease suitable for the Schwartz operation.

(5) Operation should give a dry ear in 80 per cent. of chronic mastoid disease. When the Schwartz operation is suitable the same proportion should have at least fair hearing.

(6) After the radical operation, good hearing is the exception; 80 per cent. of patients should have dry ears, while actual otorrhœa is unusual. In many, material gain in general health as well as relief of local symptoms may be expected.

(7) Associated disease of nose and nasopharynx is frequent and requires treatment.

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It is therefore not to be expected that many will have good hearing after the operation. Nor is mere improvement of great moment in itself—it makes little difference to a patient, especially if the other ear is serviceable, that he can now hear a shout at four feet which he could formerly hear only at one. In the majority of cases there was no *useful* hearing after the operation.

In 9 cases it was reported that the hearing is good, and this was confirmed in 7; that is to say, the tick of a watch normally heard at 24 inches was heard at 6 or more inches distance—a very delicate test for small losses of hearing. Conversational voice appeared to be normally heard, and one would not ordinarily perceive that the operated ear was defective (in two, the opposite ear was deaf). One patient was so pleased at the result that he insisted on having the opposite ear similarly treated—he had previously had a radical operation on both sides. Two children had hearing so acute that testing showed no defect at all. I was much astonished at the acuity of hearing in this class.

Fourteen patients had “fair” hearing in the operated ear. These include one who had had a Heath operation to conserve the hearing of the opposite ear, but hears much better with the “radical” ear. Another had had a labyrinthectomy. In all, as far as could be judged, the ear was regularly used; and conversational voice was heard at six feet or more with the opposite ear blocked.

The classification is really that of the patients themselves. In both these classes the distribution of moist and dry cavities was the same as in the whole series. In the remaining cases hearing was less than “fair,” i.e. no useful hearing. Two of these patients in whom the opposite ear was deaf, however, consider their hearing much improved by the operation, although

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cases the vitality of the bone marrow is so reduced that the anæmia approximates to the aplastic type. Great care and patience are then needed to restore the hæmoglobin to a normal figure. Liver extracts have their value, but undoubtedly the most potent remedy is iron.

The medicinal value of iron has been realized for centuries and even Celsus prescribed smithy water in which the glowing iron had been drenched.

After much dispute, it was established some years ago by Abderhalden that inorganic iron is absorbed from the gut, assimilated and converted into hæmoglobin. It supplies an essential raw material for that synthesis, and the increased activity of the bone marrow which follows its administration suggests that iron has a direct stimulant action on the blood-forming mechanism. The many preparations now in daily use are familiar to every one—the element and simpler salts, the scales and more elaborate organic preparations, the colloidal and the injectable varieties—but in chronic arthritis it is often desirable to intensify their action by utilizing the wholesome environment and routine of some suitable spa, especially when the anæmia is resistant to treatment and threatens to become aplastic in character.

Iron is a very widely distributed element and common in spring and well water. In Germany and Austria alone there are quite fifty iron wells of repute, and Great Britain, with its unrivalled deposits of the ore, possesses many others. The London area provided no fewer than twenty-eight, which flourished in the seventeenth and eighteenth centuries. The site of Hampstead Spa is still marked by a tablet at No. 17 Well Walk; but for one reason or another—contamination, failure of supply, unscrupulous exploitation or the inroads of the builder—all had closed down by the middle of the last century. The water at Islington

The Blood in Chronic Arthritis.

By NATHAN MUTCH, M.D., F.R.C.P.

Physician to Guy's Hospital.

THERE are three common changes in the rheumatic's blood which call for special treatment. They relate to uric acid, calcium and iron.

The uric acid content may be high, even when the case presents the typical signs of rheumatoid or osteoarthritis, and there are none of the classical features of gout. Any excess above 2 milligrammes per 100 c.cm. is significant, and four-day courses of phenyl-cinchoninic acid, repeated monthly, will rid such patients of their uratic excess and also of much stiffness and pain.

Rarefaction at the affected joints is conspicuous in the rheumatoid and chronic infective varieties. Demineralization does not easily lead to changes in the composition of the blood, and when the calcium value falls definitely below the normal average of 10 milligrammes per 100 c.cm. it should be regarded seriously. Parathyroid cannot be used to combat the trouble because the rise in blood calcium which follows its administration is secured by still further depletion of the tissue reserves. The only successful method is to give calcium as milk foods and simple salts or as injections in colloidal form and simultaneously to augment the fat soluble vitamins of the diet by a free use of butter, cream, milk, cod-liver oil and irradiated ergosterol. The efficacy of the treatment can be increased by a course of ultra-violet light.

Anæmia is a commonplace of chronic rheumatism. Major anæmias are by no means rare, and in certain

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cases the vitality of the bone marrow is so reduced that the anæmia approximates to the aplastic type. Great care and patience are then needed to restore the hæmoglobin to a normal figure. Liver extracts have their value, but undoubtedly the most potent remedy is iron.

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Spa ceased to flow about 1860; that at Ladywell dried up after the construction of a neighbouring drain in 1865. The famous Pancras Wells were lost when the railway terminus was completed.

Many chalybeate waters are extremely weak and their action appears to be due more to suggestion, simple diuretic powers, and the healthfulness of the localities in which they are found than to the iron which they contain. Questions of concentration have been confused by lack of a fixed method of expressing the iron content in simple terms. One analyst may state that a certain water contains 252 grains of ferric sulphate per gallon. Another, that it contains 3·6 parts per thousand, whilst a third will describe the concentration as 1 per thousand of iron. When comparing the strengths of various wells, it is most desirable to use the metric system and to consider the element iron alone, ignoring the hypothetical acid radicle with which it is supposed to be combined.

A simple classification which is useful both from the point of view of the scientist and the clinician is to divide the iron waters into three groups:—

(1) Those containing less than 0·1 per thousand of the element iron.

(2) Those containing concentrations between 0·1 per thousand and 1 per thousand.

(3) Those containing more than 1 per thousand.

It can be stated at once that most of the iron wells of Europe fall into class 1. Even such famous springs as those of Spa, which have been in continuous use since 1326, when Collin le Loup, ironmaster of Liège, drank the waters and in gratitude bought the land and founded the town, thus originating the name by which we now know all kindred establishments. The Swiss waters of St. Moritz, mentioned by Paracelsus, those at Schwalbach in Germany, and at home, the various wells at Harrogate and Tunbridge, all belong to the

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same feeble class. A concrete idea of the quantitative aspect can be gained by consideration of a typical well. For example, the "Pure Chalybeate Well" at Harrogate contains 0·009 per thousand of iron, so that if a patient is to take the equivalent of one Blaud's pill three times a day he must drink $18\frac{1}{2}$ pints of water daily. It is clearly impossible to give an ordinary medicinal dose of natural iron in a reasonable amount of fluid unless a well is chosen from class 3 or from the stronger representatives of the second group.

There are only seven springs of class 3 in Europe, and in most of them the water is unsuitable for routine internal use. Some contain other elements, such as copper and nickel, and in most the iron is in the irritating astringent, oxidized form of a ferric salt, as at Levico in the Tyrol and Linda-Pausa in Saxony. Great Britain is particularly fortunate in possessing one of the strongest springs of this class at Trefriw in North Wales, where the water contains 1·2 per thousand of iron, entirely in ferrous form, and uncontaminated by ferric salts or undesirable elements. In this case the doses and concentration are ones with which the pharmacist and physician are familiar. Three drachms of such a water represent a grain of ferri sulphas of the pharmacopœia and the equivalent of one Blaud's pill is to be found in less than one ounce. With wells of this class it is possible to secure a natural iron therapy of any intensity and one which can be controlled independently of the diuretic, psychological and other virtues peculiar to spas.

The clinical aspects of arthritis are protean, and the underlying causes variable from case to case. It is not the present intention to belittle such fundamental treatment as that of the digestive tract and other infective foci, but simply to stress the advantages which can frequently be gained by correct adjustment of the uric acid, calcium and iron in the blood.

Testicular Pain.

By KENNETH WALKER, O.B.E., M.A., M.B., F.R.C.S.

Surgeon-in-Charge, Genito-Urinary Department, Royal Northern Hospital; Surgeon to St. Paul's Hospital, etc.

THE testicle and the vas are well supplied with nerves coming from an extensive base, the renal, the aortic and the hypogastric plexus. The nerves derived from these sources anastomose freely, and as a consequence the testicle is frequently the site of pain referred from other organs, notably the kidney. But there is another fact besides this liability to be the seat of referred pain that renders the study of testicular discomfort important. There is no organ in the body more liable to be the centre around which a neurosis is formed than the testicle of a man or the ovary of a woman. The importance of ovarian pain in this connection is fully recognized, but much less has been written on the subject of the painful testicle. For this reason no apology need be offered for dealing with a condition that is not only of great importance to the patient concerned, but also one that is not infrequently met with in general medical practice.

For the sake of convenience cases of testicular pain may be divided into two groups: those in which the cause of the pain lies outside the genital tract (for example, in the kidney), and those in which it is due to local lesions. Of referred testicular pain little need be said; its significance as a symptom of renal colic, or of lesions in the neighbourhood of the renal and aortic plexus is readily appreciated. Of greater importance from the point of view of this article is pain due to organic lesions of the testicle itself. Here inflammatory conditions take first place. In cases of acute epididymitis the pain may be intense and the testicle so exquisitely tender that the slightest pressure may cause the patient agony. The pain is often of a nauseating

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variety and the patient may actually vomit. When on the right side the symptoms may suggest appendicitis, owing to the fact that the cord is also tender and the abdominal wall over the iliac fossa rigid.

With rest and hot applications some relief is afforded, but when such methods are insufficient, ease is obtained by resorting to puncture of the swollen epididymis. This must be done with care. A large-size hypodermic needle is selected and the point driven into the swollen globus minor. From it a small amount of blood-stained fluid is aspirated by means of a syringe. Some authorities recommend that after aspiration $\frac{1}{2}$ to 2 c.cm. of electrargol be injected into the tissues, but this is not to be recommended as a routine measure. For puncture Hagner substitutes open incision, if necessary, under local anæsthesia. The incision is carried down to the tunica vaginalis testis and the epididymis punctured in five or six places with a tenotomy knife. After washing out the tissues with saline the layers of scrotum are closed with two lines of sutures, drainage being provided for by means of a rubber dam. It might be thought that either of the above proceedings would be liable to leave the epididymal canal permanently damaged and the patient sterile. Actually it has been found that sterility was less frequent in a series of cases of epididymitis treated by puncture or incision than in a control series treated in the ordinary way.

As a contrast to the intense pain of acute orchitis is the dull ache that is associated with such lesions as chronic epididymitis, varicoceles, hydroceles, cysts and new growths. Here the discomfort is likely to be intermittent, or at any rate to vary in its intensity. No relation exists between the size of the lesion and the severity of the pain. Indeed, in the case of varicocele, more discomfort is often complained of when the varicocele is small than when it is large. In writing of this

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admitted that a varicocele itself, quite apart from its operative treatment, may be associated with changes in the testicle in the way of fibrosis. More especially is this likely in those cases in which phlebitis and thrombosis are present as complications, but even allowing for this it is certain that operation hastens rather than retards the appearance of degenerative changes in the testicle. Hardening of the testicle and the development of a hydrocele can scarcely be considered in themselves serious complications. But to a patient who has become neurotic over his varicocele their appearance spells disaster. He has submitted himself to an operation only to jump from the frying pan into the fire. Moreover, if the cause of his pain lay in a neuritis of the nerves of the cord rather than in the varicocele itself, his testicular discomfort may be worse even than it was before. Such patients become an embarrassment to their doctors and a trial to their friends. The following two case sheets are illustrative of two unfortunate results of ligature:—

Case 1.—Aged 28, operated on in March, 1928, on account of five years' discomfort in the left testicle, believed to be due to the existence of a varicocele. Subsequent to the operation he developed an epididymitis along with some sepsis of the cord. For this the scrotum was incised in two places and drained. After leaving hospital the pain previously complained of was, if anything, worse than before and was felt on the right as well as on the left side. Examined by the writer, October, 1928, and the following noted:—Testicles small, no varicocele, no epididymitis and no tenderness. Per rectum both vesicles hyperæsthetic, but no induration, and expressed vesicular and prostatic secretion free from pus. The patient stated that his pain was definitely relieved by coitus and rendered worse by ungratified excitement. In all probability it was referred from the vesicles and varied in intensity according to the state of congestion of these secondary glands of sex. The condition was treated by the use of a good suspensory bandage, cold douching, exercises, attention to the bowels and emptying of the vesicles by rectal massage.

Case 2.—Aged 41, bilateral ligature operation in 1920 for aching in the testicles. After the operation the pains continued. In 1927 a hydrocele appeared and the pain increased. The fact that coitus was discontinued owing to the patient's wife being pregnant seems to have aggravated his discomfort. He began to suffer from

condition, Quenie states that phlebitis and neuritis are frequent complications, the former accounting for the intense pain sometimes felt with varicocele, and the latter for the atrophy of the testicle that may follow it. What is certain is that the severity of the pain in varicocele depends on the state of vascularity of the genital tract. It is always aggravated by ungratified sexual stimulation and relieved by normal coitus. Constipation and a sedentary life tend to increase it, moderate exercise and regular action of the bowels to diminish it. Usually the symptoms of varicocele are most pronounced in psychopathic individuals introspective in character, and easily fatigued. Once his attention has been drawn to his genitalia a man of this type soon becomes hypersensitive of changes in sensation in that portion of his anatomy. He takes to examining himself in order to discover any abnormality, and before long he discovers not one, but many. Some chance remark by an ignorant friend on the subject of loss of virility throws him into despondency, and in a short time he becomes a sexual neurasthenic.

It is this tendency of the patient with a varicocele to develop a neurosis that makes the condition a difficult one to treat. An operation more often than not makes matters worse. If the end results of all operations for varicocele were collected and analysed it would be found that the operation is neither as successful nor as free from complications as is generally supposed. Ligature of the pampiniform plexus almost inevitably leads to profound changes in the testicle. E. M. Corner and C. A. R. Nitch¹ published the remote results of 100 operations for varicocele and found that in 90 per cent. hardening of the testis due to fibrosis had occurred. In 23 per cent. a hydrocele had appeared on the side of the operation. Both the fibrosis and the hydrocele were the result of venous congestion following ligature. It must, of course, be

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ing congestion, and special steps should be taken to guard against the danger of the condition becoming the starting point of a neurosis. The ideal treatment would lie in marriage, but as this can scarcely be regarded as a therapeutic measure the use of a good suspensory bandage must be prescribed. Many of these are ineffective. The best form of bandage is that worn by jockeys and hunting men and known as a "jock strap." This consists of a broad strap attached to an elastic belt which carries the whole of the external genitalia upwards and forwards over the front of the pubis. Not only does it lift the testicles but it exercises a certain amount of pressure on them. Additional measures consist of careful regulation of the bowels, the avoidance of standing and of sexual excitement, and the use of morning applications of cold water to the skin covering the varicocele, followed by bending exercises. If the vesicles on rectal palpation are tender, emptying by massage should be added to these measures.

Of equal importance is the psychological treatment of the patient. He should be told that a certain degree of varicocele is so common as to be the rule rather than the exception. He must next be assured that the worst effect it can have is to occasion a certain amount of aching and that it cannot cause impotence or atrophy of the testicles. He can be told that with increase of age, and especially if he marries, the condition will disappear of itself.

Only if this treatment fails, or if the symptoms local to the varicocele far outweigh the general and neurasthenic ones, need the question of operation be considered. To operate on a case in which neurasthenia has already developed is to court disaster. Patient and surgeon alike will come to regret the day on which the operation was performed.

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strong nocturnal erections which interrupted his sleep and increased the aching in the testicle by day. Tapping the hydrocele had no effect on his discomfort and bromides failed to prevent his erections. A temporary improvement was obtained by keeping him in a nursing home for a week, giving heroin grs. $\frac{1}{4}$ at night, hyoscyamin sulphate grs. 1-200 twice daily, and applying counter-irritants to the lumbar spine. On leaving the home the erections recurred and the patient's condition remained much the same.

Both these cases illustrate the fact that an operation for varicocele may not only fail to relieve the symptoms for which it is supposed to be responsible, but may even aggravate them. Corner and Nitch, in their paper on the remote results of operation, state that 70 per cent. were relieved of their symptoms and only some 4 per cent. rendered worse. The writer's experience of after-results has been less favourable. There are many patients who, although they may ultimately lose their pains, pass through a period of increased discomfort immediately subsequent to ligature, and as a result not a few of these become definitely neurotic. The fact that varicoceles appear at puberty and disappear in old age suggests that they are dependent on sexual activity. An additional proof that this is so is furnished by the observations that they disappear when the testicle atrophies, as, for example, after the orchitis of mumps. Varicocele *per se* is not a cause of pain, and more often than not its owner is not aware of its existence. It is only when the genitalia become congested, especially as the result of ungratified sexual excitement, that the varicocele causes discomfort. The postponement of the marriage age in civilized lands has probably had more effect than any other factor in producing painful varicoceles. J. B. Barney, in an analysis of 403 cases of varicocele, found that 81 per cent. occurred in youths and unmarried men below the age of 35.

The lesson to be drawn from this is that in treatment operative measures should be regarded as a last resort. Every effort must be made to relieve pain by diminish-

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H. Stanley Barnes has treated, since April, 1927, severe toxic cases of diphtheria by an intensive method of serum treatment with encouraging results. The type of case treated by this method was that with extensive diphtheritic membrane; cervical adenitis and periglandular oedema of severe degree; nasal discharge, especially if hæmorrhagic; foetid odour from the throat, typical of severe diphtheria; severe toxæmia characterized by delirium and restlessness or by great lethargy and hebetude. In several cases of the hæmorrhagic type in the series the patients had recovered. The average dosage of antitoxin employed for the above type of case was 70,000 units subcutaneously and 30,000 intravenously. As much as 250,000 units had been given to a case. As far as possible the whole of the antitoxin needed was given at one time, but if after a lapse of twelve to twenty-four hours the patient's response was not sufficiently good, a similar large dose was administered. During the twelve months' period under review the hospital death-rate for diphtheria was reduced from an average of 9·3 per cent. over the previous decennium, to 2·6 per cent.—(*Proceedings of the Royal Society of Medicine*, October, 1928, p. 1849.)

The Treatment of Pernicious Anæmia with Liver and Liver Extract.

T. Ordway and L. W. Gorham report a series of twenty-five cases of pernicious anæmia successfully treated with liver and liver extract, which, with the addition of 553 cases already carefully detailed in the literature, makes a total of 578 cases on record benefited remarkably by liver or a potent extract in sufficient amounts. Strict adherence to the original Minot and Murphy diet is not essential; a balanced, liberal, general diet plus sufficient liver is equally effective. The administration of dilute hydrochloric acid is unnecessary, as equally prompt improvement was obtained when this was omitted. The quantity of liver administered daily should be from one-fourth to one-half pound. There is a danger from impotent extracts; the authors have had personal experience from two of these. Transfusion is still of value in desperate cases in which the red blood count is below a million; it should be used to tide over a desperately ill patient, so that he may later take the liver diet.—(*Journal of the American Medical Association*, September 29, 1928, p. 925.)

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The Treatment of Tuberculous Iridocyclitis.

W. Stock has had successful results in the treatment of tuberculous iridocyclitis with X-rays. Apparent cure was brought about in a number of cases in from two to four weeks, and in a larger number of cases there was great improvement. The results were better in young patients than in those over forty years of age, and improvement was most marked in cases of pure iritis with nodule formation, being less successful in pure cyclitis.—(*Zeitschrift für Tuberkulose*, June, 1928, p. 122.)

The Treatment of Thrombo-Angiitis Obliterans.

C. F. Painter discusses various methods that have been suggested of treating thrombo-angiitis obliterans, and is of opinion that, in view of the two notable efforts that Nature puts forth to take care of the obstruction—namely, the canalization of the vessels and the development of collateral circulation—omitting tobacco and advising prolonged rest and postural exercises, with such sedative measures as will enable the patient to await the re-establishment of the circulation through collateral channels, is the most reasonable method. Amputations should be reserved as a last resort for toes or low-leg amputations at best, no matter what open operative inspection of the femoral artery may reveal. None of the sympathectomy operations need be considered. As for citrate or Ringer's solution, they may be appealed to as adjuncts of the other methods, but they are probably not specific for the lesions of thrombo-angiitis obliterans. A full bibliography is appended.—(*New England Journal of Medicine*, September 27, 1928, p. 598.)

The Hereditary Transmission of Anaphylaxis.

L. Nattan-Larrier, P. Lépine and L. Richard show, from their observations, that anaphylaxis is hereditary. The infants of a woman, who had been sensitized by small doses of serum over a month before their conception, were themselves sensitized, and exhibited the phenomena of anaphylaxis when given a dose of the serum. The children of women who have long before received injections of antidiphtheritic or antitetanic serum have likewise been shown to be themselves anaphylactic to serum.—(*Gazette des Hôpitaux*, October 31, 1928, p. 1,534.)

Aural Pain in Arteriosclerosis.

C. Stein draws attention to the fact that aural pain is a common complaint in many cases of arteriosclerosis which present other signs of involvement of the cerebral arteries. Accompanying symptoms may be those of headache and attacks of vertigo, independent of the pain in the ear, but insomnia is the most frequent complaint. Pain in the ear usually occurs in short attacks varying in duration from a few seconds to some minutes, though a feeling of discomfort may persist long after the acute attack has subsided. The pain may

this ointment and claims good results. It has the following formula:—

R.	Zinc oxydat.	}	-	-	-	-	aa.	150
	Amyl.	}	-	-	-	-		
	Vasel. flav.	-	-	-	-	-	-	350
	Balsam peruv.	-	-	-	-	-	-	60
	Quinolin sulphate	-	-	-	-	-	-	5
	Ichthyol	-	-	-	-	-	-	10
	Ext. Hamamel fluid.	-	-	-	-	-	-	30
	Ol. Cacao	-	-	-	-	-	-	30
	Bismuth oxyiodogallate	-	-	-	-	-	-	10
	Lanolin	-	-	-	-	-	-	ad. 1000 parts

The base of the ointment is saturated with liq. alum. acet. in one method of preparation. It has the advantage that it can be applied under a dressing which is renewed only infrequently, as it varies in consistency only slightly after a week, so that the dressing does not tend to stick to the skin on removal.—(*Klinische Wochenschrift*, October 21, 1928, p. 2,083.)

The Relationship of Infected Tonsils to Eczema in Children.

D. M. Sidlick, in view of the credence given to the assumption by many practitioners that tonsillectomy cures eczema in children, has made a careful investigation of forty-two cases, in which tonsils were removed in an attempt to cure eczema. The method employed in pursuing the study was to refer patients with eczema, between the ages of one and twelve years, to the clinic chiefs of the nose and throat department for their opinion; patients whose tonsils were definitely diseased were advised to have them removed. In every one of the forty-two children with eczema who had their tonsils removed, a temporary improvement was followed by recrudescence of the skin affection within two weeks after tonsillectomy.—(*Medical Journal and Record* [New York], October 3, 1928, p. 344.)

The Treatment of Tuberculous Glands of the Neck.

J. M. Hanford insists that early radical removal is the most important part of the treatment of tuberculous cervical lymph glands, and this results in over 90 per cent. of apparently permanent cures. The success of radical operation, apart from the technique, is dependent upon early diagnosis. The essential factors in early diagnosis include nodes enlarged to from 1.5 to 2 cm. in diameter or more, or a mass of 2 cm. or more persisting for more than six or eight weeks, without much evidence of acute inflammation; slight fluctuation; slight but definite constitutional reaction, usually anæmia, lack of energy, failure to gain weight; X-ray evidence of calcification in the neck; tuberculosis of the tonsil, if removed and studied in stained sections; a sterile culture of aspirated pus from a fluctuating part; a biopsy—but this should usually consist in a radical complete excision, combining treatment. Delay occurs during the stage of hopeful optimism and during the early part of conservative treatment. Iodine and other irritants induce and hasten the spread of the disease.—(*New York State Journal of Medicine*, October 1, 1928, p. 1,159.)

PRACTICAL NOTES

The Treatment of Tuberculous Iridocyclitis.

W. Stock has had successful results in the treatment of tuberculous iridocyclitis with X-rays. Apparent cure was brought about in a number of cases in from two to four weeks, and in a larger number of cases there was great improvement. The results were better in young patients than in those over forty years of age, and improvement was most marked in cases of pure iritis with nodule formation, being less successful in pure cyclitis.—(*Zeitschrift für Tuberkulose*, June, 1928, p. 122.)

The Treatment of Thrombo-Angiitis Obliterans.

C. F. Painter discusses various methods that have been suggested of treating thrombo-angiitis obliterans, and is of opinion that, in view of the two notable efforts that Nature puts forth to take care of the obstruction—namely, the canalization of the vessels and the development of collateral circulation—omitting tobacco and advising prolonged rest and postural exercises, with such sedative measures as will enable the patient to await the re-establishment of the circulation through collateral channels, is the most reasonable method. Amputations should be reserved as a last resort for toes or low-leg amputations at best, no matter what open operative inspection of the femoral artery may reveal. None of the sympathectomy operations need be considered. As for citrate or Ringer's solution, they may be appealed to as adjuncts of the other methods, but they are probably not specific for the lesions of thrombo-angiitis obliterans. A full bibliography is appended.—(*New England Journal of Medicine*, September 27, 1928, p. 598.)

The Hereditary Transmission of Anaphylaxis.

L. Nattan-Larrier, P. Lépine and L. Richard show, from their observations, that anaphylaxis is hereditary. The infants of a woman, who had been sensitized by small doses of serum over a month before their conception, were themselves sensitized, and exhibited the phenomena of anaphylaxis when given a dose of the serum. The children of women who have long before received injections of antidiphtheritic or antitetanic serum have likewise been shown to be themselves anaphylactic to serum.—(*Gazette des Hôpitaux*, October 31, 1928, p. 1,534.)

Aural Pain in Arteriosclerosis.

C. Stein draws attention to the fact that aural pain is a common complaint in many cases of arteriosclerosis which present other signs of involvement of the cerebral arteries. Accompanying symptoms may be those of headache and attacks of vertigo, independent of the pain in the ear, but insomnia is the most frequent complaint. Pain in the ear usually occurs in short attacks varying in duration from a few seconds to some minutes, though a feeling of discomfort may persist long after the acute attack has subsided. The pain may

extend as far back as the mastoid process, and if it is very intense, as it occasionally is, an acute mastoiditis may be simulated. The condition is recognized by a completely negative local examination together with a history of the cerebral arteriosclerotic syndrome—headache, giddiness and insomnia, with sometimes failure of memory and evidence of generalized arteriosclerosis such as high blood-pressure and tortuous radial arteries. Dr. Stein has found diuretin (theobromine), especially the calcium compound, of value in these cases. He gives it in doses of 0.5 grams thrice daily for a period of four weeks and repeats the same dosage after a month's interval. To relieve the acute attacks of pain in the ear he advises 0.05 grams of papaverin, whilst the insomnia is said to yield to luminal 0.03 grams at bedtime.—(*Wiener Klinische Wochenschrift*, October 18, 1928, p. 1469.)

The Treatment of Gastric Ulcer.

E. Desmarest and G. Debray are strongly in favour of radical excision as the method of choice in the treatment of gastric ulcer, as it avoids complications and the acid secretion of the stomach. In a series of 25 cases in which gastric ulcer was found at operation and was examined microscopically, gastro-pylorectomy was performed by the authors (Billroth I in 3 cases and Billroth II in 22 cases). The patients adapted themselves to normal feeding in about two or three months, and definite cure was brought about in 90 per cent. of the cases.—(*Journal de Chirurgie*, July, 1928, p. 1.)

Spinal Anæsthesia in Obstetrics.

G. P. Pitkin and F. C. McCormack state that, while they do not wish to insinuate that spinal anæsthesia should always be employed in surgery, past experience has taught them that with spinal anæsthesia they do not encounter the troublesome post-operative after effects, such as nausea, vomiting, gas distensions, ileus, acidosis, pneumonia and innumerable other complications, which are directly caused by inhalation anæsthesia. The primary mortality is undoubtedly less and the secondary mortality is practically nil. Morbidity is reduced to a minimum. In obstetrics they employ a special technique in order to control the anæsthetic solution and limit its contact to those strands of the cauda equina that pierce the tip of the dural sac, forming the sacral nerves. This is relatively simple with the use of gliadin (the mucilaginous content of wheat starch), which prevents dissemination or mixing of the anæsthetic solution with the spinal fluid until the anæsthetic agent has been absorbed. With this preparation, 200 or even 400 milligrams of novocaine may be employed. During injection, the patient is put in a slightly reverse Trendelenburg position and kept so throughout the course of delivery. The solution consists of: novocaine, 0.2, gliadin solution 0.13, strychnine sulphate 0.0022, glucose 0.065, normal saline q.s. ad. 0.5. A needle of small calibre is used. No greater knowledge of technique is needed than that of doing an ordinary lumbar puncture.—(*Surgery, Gynecology and Obstetrics*, November, 1928, p. 713.)

Reviews of Books.

The Essentials of Medical Diagnosis. By SIR THOMAS HORDER, BART., K.C.V.O., M.D., F.R.C.P., and A. E. GOW, M.D., F.R.C.P. Pp. xxx + 682. London: Cassell & Co., Ltd. 16s. net.

THE appearance of a manual on medical diagnosis by two such distinguished teachers of clinical medicine as Sir Thomas Horder and Dr. Gow naturally excites interest, as perhaps the greatest problem which confronts the student beginning hospital work is how to attempt to arrive at a diagnosis from his examination of a patient. The authors of this volume recognize that the art of diagnosis cannot be taught, but they facilitate the student's task by the very lucid manner in which they show that by the pursuit of suitable methods a diagnosis can be constructed from a minimum of previous knowledge. Short, yet comprehensive, sections at the beginning of the book deal with the taking of medical histories and the general principles of medical examination. Thereafter the sections are headed by the various systems, the examination of which is described in turn. A brief but clear introduction to each section is composed of anatomical and physiological considerations, a most valuable inclusion, especially in the section dealing with the nervous system, the diseases of which are only too apt to remain to the student a *terra incognita* owing to his lack of anatomical knowledge. The section on the skin contains many useful points regarding the rashes of the exanthemata; while that which deals with pyrexia is a most satisfactory review of the possible causes of this condition and gives valuable suggestions for determining the ultimate diagnosis in an obscure case. An appendix gives the various normal data relating to the blood, urine, cerebro-spinal fluid, etc. The popularity of this manual seems assured. It is practical, yet sufficiently detailed to become one of the student's recognized textbooks.

Modern Problems in Neurology. By S. A. KINNIER WILSON, M.D., B.Sc., F.R.C.P. Pp. 364. London: Edward Arnold & Co. 21s. net.

DR. KINNIER WILSON has been wise in collecting his contributions to medical journals in recent years and publishing them in this attractive volume. Perhaps the papers of most general interest are those on epilepsy, a condition which is given a wide interpretation enabling it to be linked up with other manifestations not always recognized as being akin. While admitting that the narcolepsies demand further clinical observation and research, the author brings forward good grounds for believing that some cases at least show affinities both with epilepsy and with catalepsy. Those who are engaged in the study of disorders of the nervous system will find in this book a helpful study of many obscure problems.

Preparations, Inventions, Etc.

THE NEW GLAXO.

(London : Glaxo, 56, Osnaburgh Street, N.W.1.)

Although Glaxo as an infants' food has long been favourably known to every practitioner, the New Glaxo—the name given to Prescription (Humanised) Glaxo, with added vitamin-D—marks, in view of the most recent researches in infantile dietetics, a decided advance on the older preparation. In the past there has been a tendency to recommend high fat percentages in infants' foods, in an attempt to provide sufficient vitamin-D to ensure calcium absorption and the prevention of rickets. This was known empirically long before vitamin-D was recognized as a separate factor; but it often caused digestive disorders and defeated its own object. The idea of excess of fat in infants' food is nowadays repudiated provided that sufficient vitamin-D can be given, and the problem of providing this has been solved now that a non-fatty, tasteless concentrate of vitamin-D, such as Ostelin (see *THE PRACTITIONER*, March, 1928, p. 207), is available. By the addition of Ostelin an adequate but not excessive quantity of fat can be given, which will not cause digestive troubles, and will eliminate constipation. The New Glaxo, in our opinion, is an excellent conception, and shows that the manufacturers of infants' foods are not content to stand still, but are anxious to make use of new discoveries in scientific research.

TONSIL-HOLDING VULSELLUM FORCEPS.

(London : Messrs. Allen & Hanburys, Ltd., 48, Wigmore Street, W.1.)

Mr. C. A. Scott Ridout, F.R.C.S., of Southsea, writes :—
“Having had considerable difficulty with the clip of other tonsil-holding forceps made so as to allow a guillotine or snare to be passed



over them whilst holding the tonsil, Messrs. Allen & Hanburys have made for me a cross-action spring vulsellum forceps which needs no clip and over which a guillotine can easily be passed while the tonsil is pulled out of its bed. In practice I have found this vulsellum to work well, provided the spring is made sufficiently strong. There being no clip to get out of order, this type is more simple in its action than the other types previously used.”

THE PRACTITIONER

FEBRUARY

1929

Clinical Signs and Indications of Changes in the Breast.

By SIR GEORGE LENTHAL CHEATLE, K.C.B., C.V.O., F.R.C.S.
*Surgeon and Lecturer in Surgery, King's College Hospital ; Consulting
Surgeon to the Hospital for the Paralysed and Epileptic, etc.*

IF one looks at the textbooks concerning the pathological changes in breasts, one will observe that they describe the same interpretations, now, that have been described for the last hundred years or so. Hence it seems to me advisable to examine modern research work with the object of seeing whether a fresh outlook can be obtained.

The more I study the subject the more convinced am I that certain tumours of the breast have a definite etiological relation to the physiological activities that are occurring in the breasts, when these particular tumours begin to form. In fact, these tumours consist of local excessive hyperplasia of the same tissues which are physiologically active elsewhere in the same breasts. I refer particularly to the fibro-adenoma of puberty and the fibro-adenoma that occurs in the state

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now wrongly termed "chronic mastitis." In making this statement I include the probability of benign adenomata arising in the same way in other glands. Indeed, the thyroid, colonic and prostate glands show definite indications of the same etiological significance. However, in these glands the likeness to fibro-adenoma of the breast cannot so definitely be brought home because—after all—the glands to which I have just referred are always in a state of more or less physiological activity, and therefore the coincidence of tumours and physiological activity is not so obvious in them as it is in the breast. The breast has marked periods of physiological activity with intermediate periods of rest. When a benign tumour consists of exactly the same tissues which are in a state of physiological activity elsewhere in the gland, then the inference is too strong to be neglected that this particular tumour formation and breast activity are co-related.

To make myself perfectly clear, it will be necessary: (1) To draw attention to the tissues of which the breast is composed; and (2) to describe the changes of physiological breast activities at birth, puberty and lactation. (I shall not allude to the changes that occur at human menstrual periods, because I am not at all sure what they are.) It is very important to do this, because it will introduce in this part of my subject the state now so universally described as "chronic mastitis." It will show that a breast in this state is not suffering from inflammation at all, but that it is in a state of irregular physiological activity when it should be at rest. Moreover, it will also show that the condition is subject to the formation of the same type of fibro-adenoma as that which occurs at puberty.

(1) *Normal Tissues of the Breast.*—Lining the ducts and acini is a layer of epithelium continuous with surface epithelium of the nipple. Beneath the epithelium is a layer of unstriated muscle fibres outside which is a

CHANGES IN THE BREAST

delicate connective tissue, the intra-elastica, which becomes most marked when it has undergone hyperplasia. It consists of scattered, branching cells in very delicate fibrillous matrix. These two layers are continued round ducts and acini—a very important point to remember. Further, outside the ducts is the elastica, which as a rule is not continued round the acini. Only every now and then there is a single layer of elastica continued round the acini. Sometimes a thin layer of elastica surrounds a lobule. Outside the elastica and the tissues composing the acini is the important tissue known as the pericanalicular and peri-acinous tissue. It is a loosely-constructed, delicately-formed layer which undergoes hyperplasia during the stages of breast activity and atrophy during the periods of rest. All these tissues form really part of the breast and are embedded in dense supporting connective tissue of the gland. The supporting connective tissue is not concerned in breast pathology, but it is liable to all pathological changes which occur in connective tissue elsewhere in the body. It is only very rarely that any pathological change can be traced to it.

(2) *Normal Activities in the Breast:* (a) at birth, (b) at puberty, (c) at lactation.—(a) At birth no difference can be distinguished between male and female breasts. The development of these glands has not finished at birth. They exhibit an enormous variety of changes in different infants; sometimes the *epithelium* is most luxurious in growth, and while the ducts have not definitely formed it appears in solid, branching columns which dip down into the depths of the subcutaneous tissue without the delimiting boundaries of the normal ducts and acini, and therefore the condition morphologically resembles carcinoma. The elastica has not formed at birth. In many breasts the *pericanalicular and peri-acinous connective tissue* is in a state of marked hyperplasia,

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among the fibres of which lymphocytes can be seen. Between birth and puberty the breast becomes at rest with a few well-formed ducts and acini surrounded by a little peri-canalicular and peri-acinous tissue around them.

(b) At puberty enormous activity is again manifest. New ducts and new acini form new lobules of the gland. The peri-canalicular and peri-acinous tissue again undergoes hyperplasia, amongst the fibres of which lymphocytes can again be seen. Curiously enough, the fibro-adenomata which occur in the breast at puberty consist mainly of a localized enormous hyperplasia of the peri-canalicular and peri-acinous connective tissue. In some of these fibro-adenomata no fresh acini form, but in others the new formation of acini may be enormous. Here there is a very definite example of a tumour consisting of a localized exaggerated hyperplasia of all those tissues which are behaving actively and normally elsewhere in the same breast. Physiological connection between these two events appears to me to be beyond doubt.

The fibro-adenomata of puberty are commonly lobulated, a characteristic that is of diagnostic value. The lobulation of these tumours does not depend upon outgrowths from an original tumour, but it depends upon fresh areas of the breast undergoing hyperplasia of the peri-canalicular and peri-acinous connective tissue in precisely the same way as in the original tumour. These newly-affected areas may be in juxtaposition to the original tumour, or they may be at a little distance from it. Also they form definite tumours in a part of the breast in which these tissues may have undergone a diffuse hyperplasia. The formation of a fibro-adenoma of the breast at puberty therefore may be a much more diffused process than is generally supposed.

After puberty the breast again passes into a period of quiescence which, except for the periodical interruption which occurs during menstruation, remains until

CHANGES IN THE BREAST

lactation occurs. Again these fibro-adenomata undergo enlargement at the menstrual periods. Hence they share the changes—whatever they are—at these times.

(c) All the changes seen at puberty occur in a more marked degree in the preparation for, and during, lactation. I need not repeat them; it is only necessary to say that these changes vary in degree in different parts of the same breast. In some places it is much more active than in others.

I now wish to point out that precisely the same changes I have described as occurring at birth, puberty and in lactation are also occurring in the condition now so universally and erroneously described as "chronic mastitis"; therefore "chronic mastitis" is not inflammation, but is a physiological process of activity which becomes pathological by being more irregular in degree and occurring at a time when the breast should be absolutely at rest. "Chronic mastitis" is much more common in married women who have borne children, and it is rarest in unmarried women. The similarity between "chronic mastitis" and puberty is also exemplified in the appearance in breasts suffering from so-called "chronic mastitis" of fibro-adenomata which exactly resemble those that occur at puberty. New acini form in the breast in "chronic mastitis," and new acini form in the fibro-adenomata which appear in "chronic mastitis." The whole picture is identical with the changes at puberty.

If the posterior surface of a breast suffering from so-called "chronic mastitis" be palpated after its removal, it will be found to be perfectly smooth. Then one asks: "How is it that we have been constantly taught that a breast suffering from 'chronic mastitis' is nodular all over its surface?" I will explain why that is. The nodularity one feels is not due to any change on the surface of the breast itself, but to the changes in the superjacent fat which

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is converted into lobules by the increase in size of the ligamenta suspensoria and their branches, which occurs when breasts become more pendulous and especially after lactation. It is the terminal branches of the ligamenta suspensoria that cause the nodularity by causing lobulation of the fat as they reach the true skin. If a narrow-bladed knife be inserted into the subcutaneous tissue and its blade swept subcutaneously over the surface of the gland all nodularity disappears, and it shows definitely that it was due to the presence of the ligamenta suspensoria before they were divided. Hence very great care and judgment are required in describing a breast as being multi-nodular on palpation, because the sensation of multi-nodularity is most commonly caused by this formation of the subcutaneous fat into lobules. I do not consider that multi-nodularity can be regarded as a serious sign; every now and then, however, multi-nodularity of true breast tissue does occur—that is, when the breast contains diffuse carcinoma.

I have seen two breasts of the same woman suffering from diffuse carcinoma which during eighteen months was carefully watched and treated upon the diagnosis of “chronic mastitis.” When I saw her the breasts were adherent to the pectoralis major muscles, and the surface of the skin covering the breast was very much more undulating and irregular than could possibly be described as being due to nodulation of underlying fat.

Multi-nodularity.—From what I have already said, the first question to ask oneself upon encountering this sign, that is to say, nodules felt over the whole surface of a breast, is this: “Am I dealing with a true generalized nodularity of the breast itself, or is what I feel merely a lobulation of fat superjacent to it?” There are many breasts with little or no superjacent fat. On the other hand, there are more where the superjacent fat is so abundant that even comparatively large tumours cannot be felt, and are discovered accidentally only when whole sections of the glands are cut for examination purposes. What may be felt in a breast often depends entirely upon

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the amount of this fat, which must be taken into consideration. True generalized multi-nodularity of a breast tissue itself does exist (but, as I have already said, not in the so-called "chronic mastitis," which I have termed, at the suggestion of Sir Humphry Rolleston, "mazoplasia"). True multi-nodularity exists, as I have already pointed out, in diffuse carcinoma of the breast. It exists also in multi-cystic breasts. Let me show how cysts are formed, and it will be seen that they are in no way connected with "mazoplasia." It is a disease *sui generis*, and both "mazoplasia" and cystic formations can exist alone without the presence of each other. As a rule cysts form in localized areas of the breast and are not so universally distributed as "mazoplasia," which affects the whole breast.

In the terminal ducts and acini, when cysts are being formed, there exists a type of desquamative epithelial hyperplasia which is entirely different from that existing in "mazoplasia." The type here is much more important than that of "mazoplasia" for three reasons: (1) Because it is more pathological; (2) the epithelial hyperplasia is more active; and (3) because it is so often seen complicated by an epithelial hyperplasia that is not desquamative (which for want of a term I have named "dysgenetic epithelial hyperplasia"), which has a much more menacing morphological appearance, and when it is present in the ducts and acini from which carcinoma cells have escaped, it forms a true pre-cancerous state which I believe is truly malignant. I would describe the relation of this type of desquamative epithelial hyperplasia as the first of other co-related changes in relation to carcinoma:—

(1) The proemial state. Cystic formation caused by a desquamative epithelial hyperplasia.

(2) Dysgenetic epithelial hyperplasia.

(a) Formation of papillomata.

(b) Malignant, i.e. where there is no transgression of

normal boundaries of ducts and acini (pre-cancerous).

(c) Carcinoma.

I do not assert that the proemial state invariably ends in the pre-cancerous state, nor that the pre-cancerous state invariably ends in carcinoma. For all I know they may atrophy and disappear or last a very long time.

In the formation of cysts the *terminal ducts* show an elongation and multiplication of epithelial cells, among which are colostrum-like cells in all stages of formation which finally—as they are cast off—fill the distended duct. The cells look like colostrum corpuscles, but precisely the same cell can be seen in the cystic changes of the prostate gland. In the *acini* the desquamative epithelial hyperplasia in cystic formation is a little more complicated. The epithelial cells—before being shed—pile themselves up on each other to form stunted columns. Further, there are papillomatous formations in these acini which consist of a stalk of most delicate connective tissue. As these changes progress in neighbouring acini they become confluent and finally form the large cysts of the breast. Duct cysts do not reach large sizes. I have already said that small cysts can be demonstrated in some instances to contain epithelial hyperplasia which is not desquamative but contain foci of dysgenetic epithelial hyperplasia as well. The epithelium in the large cysts is so degenerated that it does not seem capable of so reacting to any stimulus of hyperplasia. Yet I have specimens of large cysts containing carcinoma at one part of their walls. In one of these examples I was able to trace its origin to active columnar cells of a small duct which opened into the cyst. The process of cystic formation is comparatively a long way from carcinoma; but I feel convinced, in spite of much learned opposition, that it is a proemial and hence a dangerous state.

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The diagnosis of multi-nodularity of a breast due to cysts is easy. The cysts vary in size, and one or two are large enough to be definitely elastic and even fluctuating. Max Cutler, of the Memorial Hospital in New York, has shown that they are translucent and do not exhibit any shadow in transillumination. Transillumination is a definite useful addition to the diagnosis of breast diseases.

The other day I adopted it with dramatic effects. The cyst was lying deep in the breast and had thick walls. I thought it was elastic and a cyst, and others thought it malignant. It certainly puckered the skin covering it, but it was translucent and did not show as a shadow on transillumination.

Another form of multi-nodularity is caused by the normal tortuosity of elongated ducts in breasts that have been subjected to lactation and can be detected in a breast provided there is no superjacent fat to hide it. Also when there is diffuse hyperplasia elastica which under the same conditions may induce multi-nodularity.

On the whole and as a rule generalized nodularity of a breast is not a sign indicating immediate danger; with one exception—namely, that it may rarely indicate the existence of diffuse carcinoma.

Localized Nodularity.—This condition in a breast has quite another indication, and its cause should be cleared up at once by an exploratory operation conducted with the utmost care to prevent transplantation of epithelial cells if it be due to malignant disease. Localized nodularity is discovered with certainty when there is little or no superjacent fat. Superjacent fat can hide the early stages of dangerous epithelial hyperplasia and even of carcinoma itself. Moreover, these early states can escape observation when they are situated in the central or posterior aspects of breasts. In large breasts localized disease in these situations is too deep to be discoverable. In large and fat-covered breasts the task of being able to detect

early disease in these areas is impossible, and the only hope we have of being able to detect early disease in these two instances is by means of transillumination of the breast. Curiously enough, blood also shows up in transillumination, so that the situation of even small papillomata from which hæmorrhage has occurred is easily decipherable.

Localized nodularity is decipherable in thin breasts when it occurs in the superficial parts of a breast in the following causes:—

(1) Early cystic formation (desquamative epithelial hyperplasia).

(2) Early fibro-adenomata of puberty.

(3) Early fibro-adenomata of patients over 35. I have recently described an intracanalicular fibro-adenoma which originated in the intra-elastica tissue, mentioned on page 71. It is a tumour that more commonly affects people of this age.

(4) Dysgenetic epithelial hyperplasia.

(a) Multiple duct papillomata; the curious fact about these is that very often only one duct and its acini may be affected: a fact of etiological importance. Most frequently papillomata are multiple; they may fill the whole of one duct or even two ducts.

(b) Early malignant disease before the epithelial cells have escaped into the surrounding tissue.

(c) Early carcinoma.

(5) Tuberculosis.

Localized Lump.—A localized lump may be the result of many causes:—

(1) A lobulated fibro-adenoma of puberty or in women of more advanced age.

(2) A cyst.

(3) Tuberculosis.

(4) Dysgenetic epithelial hyperplasia.

(a) Duct papilloma. There may be only one in

CHANGES IN THE BREAST

the breast and then most commonly it is situated in an ampulla of the duct. An ampulla of a duct resembles to some extent a cyst; both are dilatations in which an irritant can exist and operate undisturbed for a long time.

(b) Dysgenetic epithelial hyperplasia.

(c) Duct carcinoma. Sometimes papillomata develop into true gland structure and exhibit ducts and acini within their formations. Malignant disease may arise in these miniature immature glands.

(d) The commonest type of carcinoma, viz. that in which the preliminary epithelial hyperplasia begins in terminal ducts and acini.

(5) Acute and chronic abscess.

Great attention should be paid to a stabbing localized pain also referred to the same spot.

A Retracting Nipple.—It is never caused by what is now termed “chronic mastitis” and which I call “mazoplasia.” It may be caused by an inflamed distended ampulla or a centrally situated cyst. Usually it is induced by an underlying early carcinoma or by an advanced carcinoma situated elsewhere.

A Spontaneous Discharge of Blood or Serum from the Nipple.—This can always be regarded as a most serious sign after the exclusion of traumatism.

It will be realized that I have not drawn attention to the signs of advanced carcinoma, where a lump puckers or is adherent to the skin, and discrete, hard, well-defined lymphatic glands are enlarged in the axilla. These signs are too often indicative of the inoperability of a carcinoma as well as signs of its presence (Sampson Handley). I have drawn attention to the importance of localized nodularity in thin breasts and localized lumps in breasts in which there is no puckering of the skin and no enlarged lymphatic glands.

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The Nervous Child in Our Midst.

By BERNARD MYERS, C.M.G., M.D., M.R.C.P.

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RARELY a week passes in which the nervous child is not seen in our private or hospital practice; he is certainly well known to every practitioner. Few cases give us more worry and trouble, and yet their successful treatment is most gratifying, as not only does it change the whole course and happiness of their lives, but it also means in many cases the happiness of the other occupants of the house.

Definition.—The nervous child has been described by Guthrie as one who is capable of intense emotion which can be quickly aroused and over which he has insufficient control. He describes two types—the unrestrained emotional and the restrained emotional types.

Description of the Nervous Child.—The unrestrained emotional type is generally thin and of slight build. The face is not infrequently pale and sallow, and dark lines may be visible beneath the eyes. Many of these children have what has been called by Cameron the nervous stance, in which the abdomen is prominent, the shoulders thrown well back, and the head slightly forward; lordosis is not infrequently present, and there may be winging of the scapulæ.

The nervous child appears to be a mass of animation and is possessed of restless energy, but he tires easily; after a short rest, however, he quickly revives and

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comes up smiling with renewed energy. It is unfortunate that his determination is not commensurate with his energy, and it is not difficult for him to be discouraged from his purpose. Difficulties seem to him to be greater than they really are. He is often seen to enter into things with enthusiasm, if the impulse so moves him, and works with almost fierce energy for a short period; but he is only too ready to leave his purpose uncompleted upon the least feeling of exhaustion. It is strange that this child, so often clever, is apt to be rather amiss in judgment and common sense. He is worried by trifles, and yet does not seem to be always able to do what is necessary to overcome the difficulties which cross his path. He is generally a timid child, and as a rule will not protect himself if attacked by another child. This is partly due to fear and partly to reluctance to see blood or injuries.

Most neurotic children are imaginative, fearful of trouble, and certainly apt to believe in the superstitious. The neurotic child often appears to be filled with affection, but upon a careful investigation it is not infrequently found that the basis for this affection is a distinctly selfish one. Many such children are "show-offs." They crave for sympathy and imagine that their parents, brothers and sisters, and the world generally do not understand them. The degree of vanity may be almost unlimited. Should his passing whims be not given into, a demonstration of an undue attack of temper may be made or sickness feigned. Negativism is a prominent symptom in only too many of these children; they like their own ways and desires, even if such be quite unreasonable and against the wishes of their mothers or nurses. When asked to do one thing they desire to do another, and if their attitude be not understood and dealt with properly they cause constant annoyance to the household. While liking to pry into the affairs of others, they resent too much questioning

into their own unless it serves their purpose. Such children cannot always understand why the moon should not be theirs for the asking. Many pass quickly from great happiness and delight to depression, others seem to be always happily enjoying life to the full, and either not bothering about worries or obviously placing them on one side. Discipline is strongly resented, but they expect others to carry out their wishes. Obedience does not commend itself to them, and these children are ready to use fallacious arguments to justify themselves or impress their points of view on others. The neurotic children are frequently of prepossessing ways. They learn easily and have good memories, especially for recently learnt facts. It is easy to understand how they become the pets of the family and appeal strongly to strangers. However, their whims and ways may cause friction in the nursery. Where a nervous child has done wrong, or believes he has, he may undergo inward torment, even if the cause be comparatively slight. This is more particularly evident in older children.

In many cases the vasomotor nervous system seems to be a source of trouble as instanced by the dusky-looking hands and feet, or perhaps the presence of chilblains or even Raynaud's disease. Quick changes of colour may occur in the lips and cheeks. Furthermore, palpitation, precordial pain, functional tachycardia, abdominal pains, mucous diarrhoea, constipation, headache and migraine may all be due to vasomotor disturbance. Usually there are present hypersensitiveness of taste, smell, hearing, sight and touch, particularly the last named. The intelligence is frequently above normal; some, however, are below normal, while the majority come well up to the normal level.

There is no doubt that the appetite varies greatly; some are almost voracious, while others merely pick

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at their food and are difficult to feed, and some suffer definitely from anorexia nervosa. No wonder that such babies are difficult to feed. There may be constipation or diarrhoea, and sometimes attacks of vomiting occur.

Many complain of headaches and some have attacks of migraine. Dreams and night terrors are not infrequent, nor is enuresis, while somnambulism occurs in quite a number of them. With regard to phobias there may be the fear of darkness, closed doors, people, animals, etc.

A number of these children develop habit spasms and some suffer from chorea. In a few, cyclical albuminuria is present. Others suffer from urticaria and erythema. Each child should be examined to see if enlarged tonsils or adenoids are present.

The After-History.—Many neurotic children possess great possibilities and may attain distinct success on the stage or as writers, artists or poets, if possessed of the necessary industry and staying power. Others, however, after attaining initial success, become failures in one thing after another, and some occupy undesirable positions or even undergo imprisonment.

An unfortunate few, in after life, give themselves up to alcohol, morphia, etc., and a certain number become neurasthenic, perhaps insane and possibly homicidal. An undue proportion of neurotics when grown to manhood or womanhood are found in consulting rooms and nursing homes. They crave to be cured of symptoms which to them appear to be real, but when cured soon find new symptoms from which they believe they are suffering and rush off from one doctor to another.

Some Biological and Physiological Considerations.—While the largest number of children have what is called normal physiological action of the central nervous system, some have abnormal action, and a certain number have a normal but excitable nervous system

with defective control over their cerebral activity.

Let us remind ourselves of the amœba which throws out pseudopodia and can enclose and take a particle into its cell, digesting and assimilating what is desirable and extruding the undesirable. Again it will withdraw its pseudopodia from an undesirable particle, and yet the amœba has never been described as having a nervous action. We have the same thing more or less with our own leucocytes. Certain sponges show neuroid transmission. Some simple forms have a special receiving epithelial cell, the receptor which receives the stimulus and transmits it to the contractile cell, the effector. We next come across a communication network which allows the impulses from some receptive cells to be transmitted to many muscle cells instead of being restricted to a group. Protoneurones or primitive nerve cells appear in jelly-fish and sea anemone.

Finally, in the vertebrate neurone we find a differentiated cell which is produced in the embryo by special cells. The nerve cell or neurone consists of a cell-body with usually several processes called dendrites and one called an axone. One or more dendrites lead to the cell-body, but usually there is only one axone from which collaterals are not infrequently given off. Where the dendrites of one cell come in contact with the processes of another cell a synapse is formed. It is believed that these processes must be capable of functional contact for the stimulus to pass through the dendrites to the cell-body and the axone.

Dercum states that there are ten million neurones in the cortex, and each part of the cortex is in relation with every other part. Consciousness is stated to be of cortical transmission and to be present in neurones which are actively concerned in transmission. A neurone at rest may, therefore, perhaps be looked upon as being unconscious, and from consciousness the neurone can go to the subconscious and the uncon-

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scious. It has been held that attention consists in the undisturbed transmission of the impulse whether exteroceptor, interoceptor or proprioceptor to the cortex to the exclusion of ingressing disturbing impacts, while in lack of attention there is ingress of interfering transmissions.

The special function of the cortex is synthetic, analytic, and discriminative. To the thalamus belongs emotional reaction such as those connected with sensations of touch, light or sound, thirst, hunger, sexual feeling, comfort, discomfort, well-being and also such feelings as anger and fear.

Concerning the endocrines, the sympathetic group (catabolic)—the thyroid, pituitary and chromaffin system—is synergic and releases energy, while the autonomic or vagotonic group (anabolic)—the thymus, parathyroid and pancreas—which is synergic, is also concerned with digestion, assimilation and the storing of energy.

In considering the nervous child the question is asked, are the nerve cells of his cortex, etc., more sensitive, excitable and more easily run-down than the nerve cells in the ordinary child? When he is inattentive, are the synapses more likely to draw apart than is usual, that is assuming it be allowed that such action can occur in the synapses? Are the emotional areas in the thalamus more sensitive or less stable than with the ordinary child or is the cortical control less perfect? When the neurotic child comes on to the scene in a mass of boundless energy, disturbing everyone with his activity and excitement, is the sympathetic endocrine group responsible? Again, in the frequent circumstance when he suddenly gives up his purpose or states he feels tired and irritable, is there some abnormal action in the autonomic group or in the sympathetic? Numerous possibilities may be pictured in which any of the above may be at fault, sometimes

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afraid of the dark, of traffic or of animals, or for screaming fits, night-terrors, somnambulism, enuresis, or what is called obstinacy.

CLINICAL EXAMPLES.

Anorexia Nervosa.—A neurotic girl aged five years had suffered for nine months from a very poor appetite. She was very dainty and the best of everything alone was good enough for her, and that daintily served. She ate so little and needed so much coaxing even then, that she had not gained an ounce in nine months, and her people were alarmed. She alone was unperturbed and seemed even inwardly to appreciate the consternation she caused. The parents were informed practically to ignore her poor appetite, and to let her have her food alone for a time. This, however, was difficult in this case. The exhibition of bromides and appetite tonics completely failed. Noting how she seemed to be evidently enjoying the situation, I spoke to her alone and asked if she would like to have a secret with me. She said she would very much. I then told her that if she ate as much as she possibly could at each meal during the next week and told nobody the reason why, her mother and father would be astonished. She did, gained 16 ozs. that week, and gloried in receiving so much praise for her appetite.

A girl aged two years had gained about an ounce in eight months and was a great source of worry to her parents, grandparents and certainly to the doctor. When I saw the child, the mother held her tightly, watching every movement, and trying to pacify her when she cried. It was insisted on that the child should be given to the nurse, and her crying and endeavours to attract attention to herself absolutely ignored. In ten minutes time, the child, finding that her efforts no longer paid, ceased her crying and other tricks, and remained quite good for the rest of the interview. It was agreed to send this little patient to a special nursing home with a very understanding sister in charge. The child was given no medicine, but soon found that crying and other antics did not pay and brought her no attention. These therefore ceased, and she took her food well and regularly and gained 14 ozs. during the first week.

Enuresis.—Before diagnosing the enuresis as being due to the neurotic state of the child, it is essential to negative kidney disease, pyelitis, stone, inflammation of the bladder, or urethral trouble, worms, etc., enlarged tonsils and adenoids, constipation, major or minor epilepsy, diabetes mellitus or insipidus, brain trouble, idiocy, etc. Obviously the treatment of enuresis will be that of the cause, and with the nervous child he is treated essentially as such. In addition to

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the nerve-cells and at other times the endocrine glands.

Dr. Mackenzie Wallis and I have been working for some time on this problem and Dr. Wallis has investigated the lime-salts and cholesterol in the normal and neurotic child; his conclusions are as follows:—

CaO. In normal child is 11 mgrms. per 100 c.cm. blood.

CaO. In neurotic child is 6 mgrms. per 100 c.cm. blood (on an average).

Cholesterol in normal child is 0.16 gm. per 100 c.cm. blood.

Cholesterol in neurotic child is 0.16–0.26 gm. per 100 c.cm. blood.

As it is usually held that a nerve cell in a serum containing a deficiency of lime-salts is more irritable than normal, these findings are interesting and agree, I believe, with those of other investigators. As to the meaning of the increased cholesterol content our knowledge upon the subject is not sufficient to formulate an opinion. It might be inferred from the above that the action of the parathyroid gland plays a distinct part in the causation of the neurotic symptoms in this type of child, which again suggests some midway position between normality and tetany.

Statistics.—Of twelve hundred children examined at the Children's Clinic, 11 per cent. were neurotic, with an equal number of males and females. The mother was neurotic in over 95 per cent. of the cases, and the father in about 5 per cent. In one instance, the mother, the maternal grandmother and great-grandmother had been distinctly neurotic. Quite a number of the relatives of these children suffer from hysteria, habit spasms, etc. In some cases epilepsy was in the family, and a few had relatives in mental hospitals. In a family of four or five there may be only one neurotic child, but in many instances there are more, and in one family all six children were neurotic. Babies have definitely been diagnosed as being neurotic at three weeks old, but the majority of the children are brought by their mothers between the ages of two to seven years on account of being very excitable or fidgety, sleepless,

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afraid of the dark, of traffic or of animals, or for screaming fits, night-terrors, somnambulism, enuresis, or what is called obstinacy.

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general treatment and a mixture containing bromides and valerian, it is wise to give the child the assurance that he will be cured and that he has not committed any crime in bed-wetting. Self-confidence is a great help in the cure. Should the child micturate, say, every hour during the day, the child should be taught to go at least a quarter of an hour longer for a couple of days, and then add another quarter or half-hour to the period until ultimately he learns to retain his urine for about four-hourly periods. We have found this method a distinct help in these cases, and it adds to the child's confidence. It is well to give only sips of fluid after 4.30 p.m. If the time at which the accident happens be ascertained, the child should be got out of bed half an hour beforehand. This also adds to the child's confidence in himself when he finds in the morning that he has a dry bed. Drugging by belladonna, etc., is really unnecessary.

High Temperatures.—In quite a large number of neurotic children high temperatures are recorded from time to time and without adequate cause. We may take it that these children do run a temperature for much less causes than ordinary children, but I suggest that we should never rest in any such case until we find the condition, even if slight, which is at the bottom of the process. A thorough examination should be made of the child, not only as to the presence of any of the ordinary infectious diseases, chest trouble, etc., but also especially to investigate the urine, the throat—particularly the tonsils, the ears, the antra, bones and joints. Certainly many of these children show a slight tonsillitis as the cause of the high temperature.

Stammering.—When a child stammers we again have to negative all other possible causes but nervousness before treating him as such. With the nervous stammerer we can assure him that he will be cured, and that the cure lies in his own hands. This generally

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comes as a surprise and pleasure to the child. The parents must be informed that neither they nor any member of the household is ever to call attention to, or appear to notice, the stammering. The stammering child should be taught to take slow deep breaths, about ten times morning and evening, after that he should be taught to phonate "ah" slowly but audibly. When that is finished, the ordinary labial, dental, lingual articulating sounds should be made under a sympathetic and competent person. Then he should be shown how to breathe properly and speak after an inspiration, quietly and slowly, with the eyes looking straight in front of him, mono- or di-syllabic words. Singing is also most useful if it be properly taught, and particularly the correct manner of breathing. Practically all these cases can be cured, and in time they will learn to speak quietly, slowly, and confidently.

Negativism.—A girl aged four sorely tried her mother and nurse by refusing to do that which she was asked and doing the opposite. Thus, when beseeched by the doting mother to eat her food, she merely played with it, but refused to swallow it. The obvious distress of mother and nurse only increased the child's negative attitude. She at least enjoyed the situation, and the more so as her mother's obvious distress increased. When implored in the morning to go to stool, she inhibited the normal action. When it came for her to be dressed to go for a walk, she refused and ran to the other end of the house. When brought downstairs and begged to be good by the nurse, she deliberately walked in the mud. At last the nurse placed the crying and kicking child in a push-cart, and the mother appearing on the scene promised her some chocolates and a toy if only she would be good. She ate the chocolate and threw the new toy in the mud. Not only dressing and undressing had become serious ordeals, but going to bed was positively dreaded by the household. She kicked and screamed, and when at last the exhausted nurse placed her in bed imploring her to be good and go to sleep, she would lay awake until 11 o'clock at night with a light in her room and the mother and nurse each holding a hand. Occasionally she would develop fits of temper and lie on the floor holding her breath for ten to twenty seconds at a time, causing positive consternation to her terrified mother. The mother was assured that her child was perfectly healthy, but purposely opposing all her wishes out of the pure enjoyment in doing so. The mother agreed to go away for a month and the nurse was replaced by a quiet, firm, understanding woman whose "No!" was obviously

general treatment and a mixture containing bromides and valerian, it is wise to give the child the assurance that he will be cured and that he has not committed any crime in bed-wetting. Self-confidence is a great help in the cure. Should the child micturate, say, every hour during the day, the child should be taught to go at least a quarter of an hour longer for a couple of days, and then add another quarter or half-hour to the period until ultimately he learns to retain his urine for about four-hourly periods. We have found this method a distinct help in these cases, and it adds to the child's confidence. It is well to give only sips of fluid after 4.30 p.m. If the time at which the accident happens be ascertained, the child should be got out of bed half an hour beforehand. This also adds to the child's confidence in himself when he finds in the morning that he has a dry bed. Drugging by belladonna, etc., is really unnecessary.

High Temperatures.—In quite a large number of neurotic children high temperatures are recorded from time to time and without adequate cause. We may take it that these children do run a temperature for much less causes than ordinary children, but I suggest that we should never rest in any such case until we find the condition, even if slight, which is at the bottom of the process. A thorough examination should be made of the child, not only as to the presence of any of the ordinary infectious diseases, chest trouble, etc., but also especially to investigate the urine, the throat—particularly the tonsils, the ears, the antra, bones and joints. Certainly many of these children show a slight tonsillitis as the cause of the high temperature.

Stammering.—When a child stammers we again have to negative all other possible causes but nervousness before treating him as such. With the nervous stammerer we can assure him that he will be cured, and that the cure lies in his own hands. This generally

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unsuitable environment. All his life he had suffered from nervous symptoms, but now complained that he felt he was going to die, and that his heart palpitated severely, causing him infinite anxiety and distress. He now began to stammer, his memory had become bad, and he had difficulty in collecting his thoughts. He felt the necessity to breathe consciously from time to time, and travelling in a bus terrified him lest he should faint. As a matter of fact his heart and other organs were sound, and, when he felt convinced of this and a suitable life was mapped out for him, he lost practically all his symptoms. One may certainly also ask here if he would have developed neurasthenia had his early environment been more suitable.

Sleeplessness.—Many nervous children show negativism about going to bed and lie awake in a restless state for hours, and when they do fall asleep, being light sleepers, their brains are only too apt to be set into activity, and they dream or may suddenly awake with night-terrors. As far as possible, disturbing or distressing scenes should be avoided during the day and, if they have occurred, made light of. A well-ventilated night nursery is essential. It must be kept quiet and the blinds should not allow the light to penetrate into the room. The child ought to be taught to be interested in its environments, whether in the street or at home. His walks should be made pleasant and an interest shown in flowers, trees, animals and games. The food must be suitable for him, the night clothing light, and not too tightly placed around him. There should be no holding his hand, and no light in the room; but it is often wise to have a light in an adjoining room and the door of the night nursery left partly open. This and the knowledge that the nurse is quietly sitting in the next room give him confidence. A dose of bromide is sometimes advisable to be given at bedtime for a few nights only.

Examination of the Nervous Child.—The point to emphasize is the necessity of apparently ignoring the nervous child while he is being examined. Even if he cries, kicks, or starts to throw things about, it is wise simply to go on with the examination, paying no

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"No!" and "Yes!" was "Yes!" The child was occasionally told about a former charge of the nurse whose good points appealed to her, and as the child got praise for it she desired to have similar praise for herself. She found herself making little drawings, playing with toys, helping nurse to lay the table, and getting the bed ready to be slept in without realizing how it all came about. Praise was dealt out to her when she merited it, and the desire to do the right thing was now as great as her former negativism.

Convulsions.—A girl of six had been treated for two years as a nervous child and improved distinctly, notwithstanding a neurotic environment. She suddenly had an attack of appendicitis and immediately ran up a temperature of 105°, became delirious, convulsed, and then comatose within 24 hours of the commencement of the attack. Immediately the appendix was taken out the convulsions and coma ceased and the temperature went down to 99°, the child making a perfect and uneventful recovery. The pleased mother unfortunately now disregarded the precise environment desirable for the child, and the child had become distinctively nervy again a year afterwards. Her excited state was on one occasion followed by a convulsion. This child's blood calcium was only 50 per cent. of normal.

Restrained Neurotic Type.—A girl aged 15 had a brother and a sister of the most pronounced neurotic type, but she herself, while full of emotions, always endeavoured to restrain them, and upon a casual observation looked calm and composed. She was quiet and rarely spoke to other girls. Strangers not understanding her had thought that she was below their mental standard, and when employed with other girls in painting flowers on dresses, which we were informed she did quite well, she unfortunately developed the inferiority complex severely. A change of environment and reassurance as to her ability as compared with other girls greatly improved her mental outlook.

Headache.—A boy of seven complained of severe headache from time to time. No ocular or other defect was discovered. He was very excitable, and his headaches were always worse after great excitement or if he became depressed, which he sometimes did from slight causes. He was sent to the seaside for a month, lived an open-air life, with plenty of sleep at night-time and an hour's rest midday. For the first week he was given small doses of bromide thrice daily. He returned home looking the picture of health and had been free from headache that month. It is possible that his headaches were of the vasomotor type.

Hysteria.—A girl of 19, the only neurotic child in a healthy family of five, developed hysteria. She had been used to being given in to by the rest of the family, and while protesting her great affection for them was in reality the only selfish one. There would seem no doubt that her hysteria could have been prevented if she had been efficiently treated years before as a neurotic child.

Neurasthenia.—A man of 38 suffered severely from neurasthenia. As a child he had been very excitable, emotional, restless, afraid of people and animals and of the dark, and suffered from night-terrors. He had never been treated for his condition and had lived in an

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unsuitable environment. All his life he had suffered from nervous symptoms, but now complained that he felt he was going to die, and that his heart palpitated severely, causing him infinite anxiety and distress. He now began to stammer, his memory had become bad, and he had difficulty in collecting his thoughts. He felt the necessity to breathe consciously from time to time, and travelling in a bus terrified him lest he should faint. As a matter of fact his heart and other organs were sound, and, when he felt convinced of this and a suitable life was mapped out for him, he lost practically all his symptoms. One may certainly also ask here if he would have developed neurasthenia had his early environment been more suitable.

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attention to his antics. The child soon finds that his efforts are in vain, and that they don't pay. The examination can then usually be carried out completely and quickly, including the examination of the throat as a routine practice. The mother should be given to understand beforehand that the child must be left entirely to the nurse, and the latter must carry out the doctor's injunctions and simply hold the child and ignore his appeals. This examination often becomes an object-lesson to the mother in the treatment of her child.

The Nervous Child in Sickness.—It is always a great trial to the medical practitioner when the sick child is a neurotic. Should the child be severely ill, or too weak to make himself heard, he will not become an obstructionist; but if otherwise, and he be unrestrained and given in to, his antics will be a sore trial to the doctor and the nurse. It is essential to enter the sick room without apparently taking any notice of the little patient, and then quietly and gradually proceed with the examination, quite ignoring any protest. If this be carried out, especially if the nurse is a suitable one and the mother not in the room, there is not likely to be much trouble in future examinations.

Nervous children sometimes get delirium with any marked rise of temperature; however, it is not desirable to give medicine for this because the mother has become very anxious, but only if there be other reasons. It is well to keep in mind that, however pronounced a neurotic the child may be, it is necessary thoroughly to examine him to make sure that there is no pathological condition present. A strange nurse is preferable for a neurotic child in sickness, and she ought to be a well-trained, quiet, sensible woman, with good understanding, common sense, and enough determination interwoven with fairness, sportsmanship and self-control. She will teach in a quiet way useful

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lessons to her little charge, which will not only enable him to control himself more in sickness and thus help his recovery, but will also bear good fruit during his convalescence and after.

The Question of School.—The medical man is asked from time to time if the neurotic child should be sent to school and when.

With regard to boys, he may attend a morning school until he is eight to ten years of age, when he can be sent as a boarder to a suitable school where the schoolmaster is understanding and the hygienic arrangements, playing grounds, etc., are satisfactory. It should be explained that not only does the lad need plenty of fresh air, good light to read by, a sufficiency of exercise without exhaustion, sufficient sleep, not too prolonged mental work, but he also requires what is very important—a suitable boy companion. This boy should be of the non-neurotic type, a good sportsman and reliable. The food should be good, and it should be seen that the lad eats slowly and does not bolt it. The normal functions must be looked after, and it should be explained to him that he can approach the master on any day upon any matter, and the master should give him from time to time a heart-to-heart talk. It is particularly necessary to keep away undesirable companions, as these boys are apt to be easily influenced by others. He should be taught to play the game, to be a sportsman, and to learn the team sense. Boxing, rugby football, cricket and other games will help to teach him self-control, which is essential for his well-being and success in after-life.

Obviously, any defects of sight or hearing are to be treated. These children frequently learn easily, but their memories should never be over-taxed, nor should they be made to work for too long at a time. Not infrequently such children are picked out to work for scholarships, but mental overstrain may cause a break-

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peculiarities, and gentler means lead to greater success. Good example is essential along with the correct environment. Confidential chats from time to time with the right person are most useful and do infinite good. Again, undesirable companionships spell great danger, and a suitable companion of the non-neurotic type must be chosen for the neurotic boy or girl.

The neurotic baby is often awkward in suckling. The child should be handled as little as possible, kept quiet and have every chance to sleep peacefully in a warm cot. He should be brought to the breast before he is fully awake. The taste being as a rule hypersensitive, digestive difficulties may appear early, and care has to be exercised to keep the child on the breast milk. Should the child have to be placed on a milk-mixture, the taste of the mixture should not be allowed to vary much. Nervous babies ought to be accustomed at once to a well regulated routine. The room should be made dark and the cot warm before the child is put to sleep. Noises must be avoided, as the nervous child is apt to start at the least sound. The baby takes its cue from its mother's face as to who will be master, and it must be the mother.

From the age of two years discipline is even more necessary, but easier of attainment, and the things that matter are good example, suitable environment, sympathy with fairness, firmness, honesty and sportsmanship to be shown by the parents. If children are not all perfect, neither are all parents; and the doctor can distinctly help neurotic parents by informing them as to the correct way to bring up their child. Parents should not unnecessarily lose their temper lest their children lose respect. Things should be explained quietly and the right methods commenced at an early age, so as to make use of the most impressionable time in a child's life. If a promise has to be broken to a child, the reason should be frankly

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down and the failure bring disappointments and a train of undesirable symptoms. Some of these children with thwarted ambition show hatred and jealousy of rivals, and sometimes, wishing to get what they believe to be "their own back" on other boys, will pilfer or do other things which will ultimately lead them into trouble with the masters. No boy needs to learn *esprit de corps*, manliness and self-control more than this boy.

Neurotic girls can attend a day school near their home until the age of 12 to 14 years, when they can be sent to a suitable boarding school. More or less the same principles apply to them as to the boys—with regard to the mistress, a suitable girl companion, hygiene, sports and playing the game.

GENERAL LINES OF TREATMENT.

We must realize the fact that a neurotic child born will always remain of the neurotic disposition; but if we can teach him self-control, the tendencies of his disposition are not likely seriously to interfere with his life, and in some ways will give him advantages, as in the realm of imagination. The mother is generally neurotic and, therefore, it is necessary that she should learn self-control in order that she can help to place the correct environment around her child. Where the environment remains impossible it is desirable that the child be placed under the care of a suitable nurse or person in the house, or sent away to a relative or friend living in the country who has the necessary qualities to look after him. At a later period a school should be carefully chosen which will carry on the good work.

Neurotic children are very sensitive to corporal punishment which, if used indiscriminately, will cause much more harm than good. They are sensitive, impressionable, and in many cases aware of their own

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The Periwinkle Cæcum.

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*Corresponding Foreign Member, Belgian Royal Academy of Medicine ;
late Medical Radiographer, Guy's Hospital, etc.*

VISCEROPTOSIS," or dropping of the viscera, is still a contentious subject, and this article in *THE PRACTITIONER* is founded on a paper which I read at the Second International Congress of Radiology at Stockholm in July, 1928. There are some who argue that the intestines can act as well when they hang low as when they are at the normal height; and that local thickenings in the mesenteries need not interfere with peristalsis or with the passage of feces. I am convinced they are wrong; they overlook the fact that a drooping bowel is apt to curl round in such a way that torsion is produced and may obstruct and paralyse the bowel. A thickening in the mesentery can only be harmless when it is not pulled upon; if, however, the bowel drops on either side of the thickening, an angular kink appears and causes an obstructive spasm.

A periwinkle or whelk lies curled up in its shell. When extracted in the orthodox manner, with a bent pin, an experienced operator knows how to give the shell just that slight rotation that enables him to extract the winkle complete with its tail. The traction straightens out the tail, but on emerging it curls up again into the position it had occupied in the helix of the shell.

The Intrapelvic Cæcum.—In cases—frequent enough—in which the cæcum has dropped and is habitually in the pelvis, the exact "lie" of the cæcum is not easily ascertained. The radiologist finds the cæcum too deep to be reached by manipulation. When a surgeon

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stated and in a kindly manner so that the child can understand and appreciate the confidence thus displayed in him. The nervous child ought never to be scolded in public, but quietly spoken to alone by the mother or nurse. It must not be forgotten that some encouragement is necessary as occasion suggests, and credit for good qualities should not be withheld, but yet, of course, not overdone.

Our idea in bringing up the neurotic child is to train him so well physically and mentally as to allow him the chance of achieving his best possible, while at the same time inculcating in his mind that necessary self-control which is essential to the attainment of the ideal. It will be easy to impress on the child so brought up the best moral lessons.

The child ought to be informed as to the meaning of sex when old enough to understand it in a clean and wholesome manner, and the proper person to do so is the mother or father. The danger is ignorance and pollution. Biological references will be useful and informative. A useful age to commence is about eight, and references thereafter will be made from time to time and again at puberty, as no child needs more careful handling on the subject of sex than the neurotic. Finally, we shall all agree that the one time method of placing nervous children in a dark room, semi-starving, threatening and whipping them was barbarous and very harmful, in that it ended by bringing out their worst qualities and suppressing their best ones.

Freudism.—On this subject we may state no more than that if certain cases can be explained partly or entirely by its teachings it is not suitable to be used generally for the neurotic child, as quite emphatically we can assert that the majority of the peculiarities of the neurotic child have nothing whatever to do with sex, and to imply otherwise might easily result in much harm.

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operates in such a case, say for removal of the appendix, he cannot obtain a view of the cæcum and appendix as they lie in the pelvis. To bring them into view, he must draw the ascending colon upward until the cæcum appears. Many times have I watched the cæcum brought into view in this way, and on several occasions I have seen it curl up immediately, just like the periwinkle.

Mechanism of the Periwinkle Cæcum.—If the cæcum has a free mesentery and contains a load of fæces, it hangs down whenever the upright posture is assumed. Other heavy portions of the intestines are pulled down also. Gradually the mesentery slips down from its attachment along the posterior parietal wall, so that the entire abdominal viscera occupy a lower position than they should.

The cæcum drops over the pelvic brim and eventually rests upon the floor of the pelvis. The cæcum can fall no lower, but the ascending colon goes on dropping till it reaches the true pelvis where it rests in front of the cæcum. As the ascending colon slips lower and lower, the cæcum begins to curl back till the fundus of the cæcum faces backward, then backward and upward, and finally directly upward; the cæcum and ascending colon then take the form of a J. (Figs. 8 and 9.)

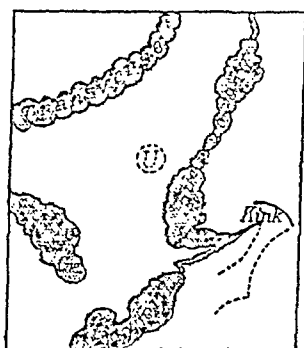


FIG. 1.—Sharp kink of iliac colon.

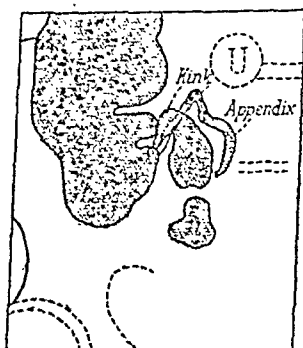


FIG. 2.—"Controlling" appendix and Lane's ileal kink.

THE PERIWINKLE CÆCUM

Effect on Terminal Ileum.—Now consider the effect of this backward rotation upon the end of the ileum. The ileum is inserted into the side of the cæcum and must, inevitably, be rotated upon its own long axis by the backward turning of the cæcum. This ileal torsion is the more severe the greater the rotation of the cæcum.

X-ray Demonstration of Periwinkle Cæcum.—As already stated, the radiologist cannot—by palpation under the fluorescent screen—determine the exact relation of the terminal ileum to the cæcum when the latter is out of reach in the pelvis. Some years ago, however, I devised a method of demonstrating the periwinkle cæcum, namely, the oblique view. The oblique view is obtained in a very simple manner: Suppose the patient lying flat on his back; the right or left side is raised, hip and shoulder simultaneously, so that the trunk and chest are inclined at about 45° to the horizontal. He is supported in this oblique position by a cushion under the back.

Ileal Torsion.—In the supine position, when the cæcum is in the pelvis, the cæcum and the lower ileal coils give a confused shadow, the outline of the cæcum lost in the ileal shadows. (Fig. 3.) In the left anterior oblique view, however (left side of body raised), an excellent view of the terminal coil of the ileum and the ileo-cæcal entrance may be obtained.

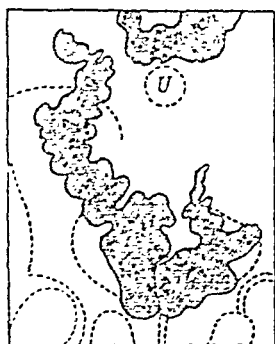


FIG. 3.—Pelvic cæcum; front view does not show the terminal coil of the ileum.

When to Observe Ileal Torsion.—The most favourable period for studying ileal torsion is the rather short one during which the last portions of bismuth are passing into the cæcum. If, however, there is much delay in

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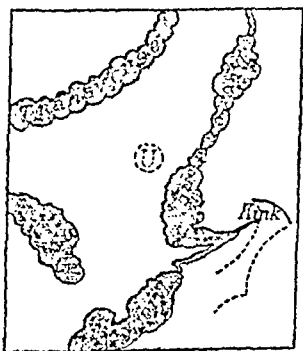


FIG. 1.—Sharp kink of ileal colon.

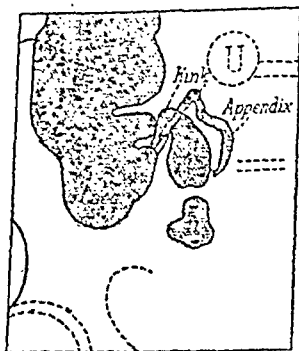


FIG. 2.—"Controlling" appendix and Lane's ileal kink.

THE PERIWINKLE CÆCUM

When to Observe the Periwinkle Cæcum.—The right anterior oblique position is the only one that gives a view of the back-turned cæcum in the pelvis. The

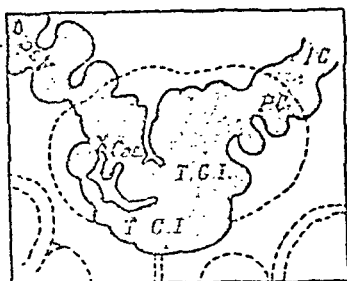


FIG. 6.—Severe ileal torsion. Left anterior oblique view. (There was a chronic duodenal ulcer.)

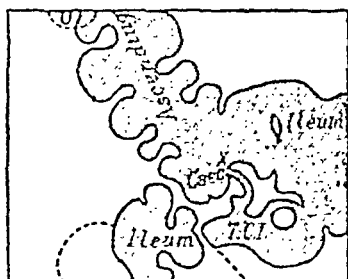


FIG. 7.—Severe ileal torsion. Left anterior oblique view. x—Ileo-cæcal entrance.

twenty-four hours' visit is, as a rule, the most favourable; the ileum then contains no bismuth, while the cæcum and ascending colon are still well filled.

Stages of the Periwinkle Cæcum.—All degrees of ptosis occur; consequently any stage of backward-curling of the cæcum may be found. The degree of

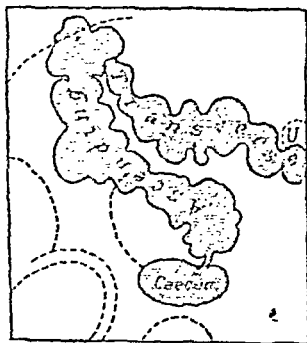


FIG. 8.—Pelvic cæcum. Right anterior oblique view. Cæcum has begun to curl back.

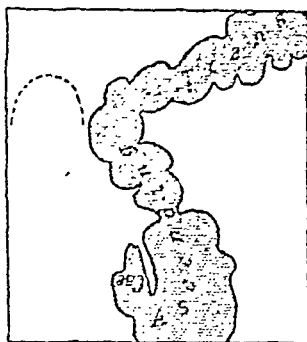
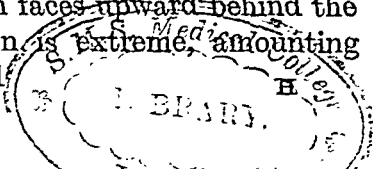


FIG. 9.—Typical "periwinkle" cæcum. Right anterior oblique view. Cæcum curled back so that it faces upward. FIG. 5 shows extreme ileal torsion induced thereby.

ileal torsion depends on the degree of backward curling of the cæcum. If the cæcum faces upward behind the ascending colon, ileal torsion is extreme, amounting



the stomach (and this is the rule rather than the exception in the type of case under consideration), there may not, at any period, be too much bismuth in the lower ileal coils to prevent a good view of the ileo-cæcal entrance. A view at five or six hours, supplemented if necessary by another at seven to nine hours, is enough in most cases.

The Terminal Ileum in Ileal Torsion.—The relation of the terminal ileum to the pelvic cæcum, as shown in the left anterior oblique view, is not constant from case to case, though fairly constant in any one case at different times. The terminal coil may enter the cæcum from above, behind or below. Usually the coil exhibits excessively active peristalsis; the portion in front of a wave becomes widely distended; there is spasmodic

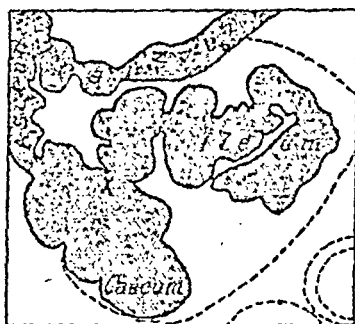


FIG. 4.—Ileal torsion. Left anterior oblique view.

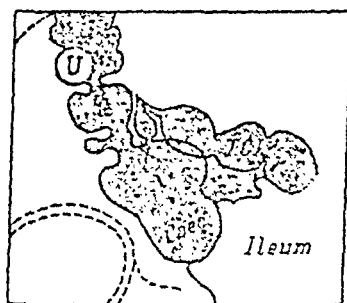


FIG. 5.—Extreme ileal torsion. Left anterior oblique view (see also FIG. 9).

constriction of the last half-inch or more, ending at the ileo-cæcal entrance. Spasm at the ileo-cæcal entrance is a constant and striking phenomenon. It may be the only persistent spasm, but more often it is the last of a series of spasmodic constrictions along the terminal coil. At some of these places the narrowing is due actually to torsion; there is a "twist" in the coil, causing partial obstruction, but the obstructive effect of the twist is much increased by added spasm. (Figs. 4, 5, 6, 7.)

THE PERIWINKLE CÆCUM

When to Observe the Periwinkle Cæcum.—The right anterior oblique position is the only one that gives a view of the back-turned cæcum in the pelvis. The

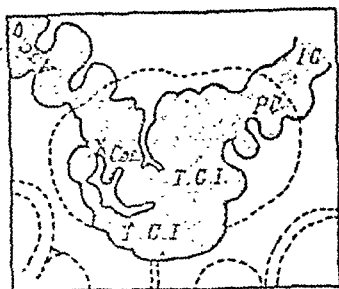


FIG. 6.—Severe ileal torsion. Left anterior oblique view. (There was a chronic duodenal ulcer.)

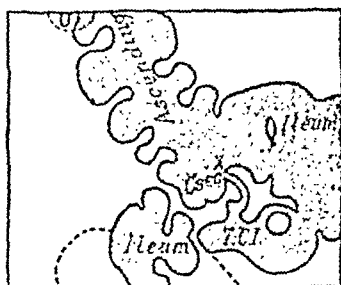


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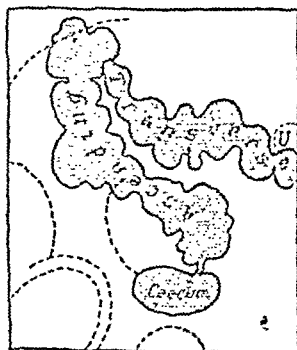


FIG. 8.—Pelvic cæcum. Right anterior oblique view. Cæcum has begun to curl back.

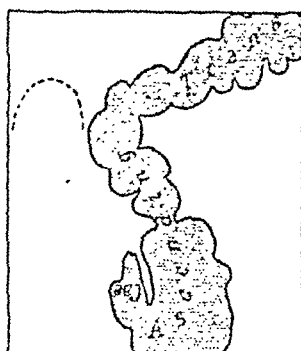


FIG. 9.—Typical "periwinkle" cæcum. Right anterior oblique view. Cæcum curled back so that it faces upward. Fig. 5 shows extreme ileal torsion induced thereby.

ileal torsion depends on the degree of backward curling of the cæcum. If the cæcum faces upward behind the ascending colon, ileal torsion is extreme, amounting

to 180°. (Figs. 8 and 9.)

Complete X-ray Investigation Necessary.—Ptosis of the cæcum is but an incident in stasis, due to habitual overloading of the cæcum and ascending colon. Consequently it cannot be treated as an entity, but must be regarded as one of the many adverse consequences of stasis. A complete X-ray investigation of the digestive canal with bismuth must be made. The main—or primary—cause of overloading of the cæcum may be revealed to be a high, sharp splenic flexure, or a kinked iliac colon (Fig. 1), or an enormously elongated pelvic colon. (Fig. 10.)

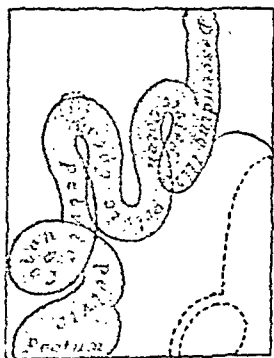


FIG. 10.—Great elongation of pelvic colon.

TREATMENT.

These disabilities (all of which may be found in a single patient) must be rectified, as far as possible, to enable the cæcum and ascending colon to drain effectively; as long as they remain overloaded, ptosis cannot be corrected; and until they are restored to their proper place, ileal torsion cannot be abolished.

Surgery.—The best method to adopt in each case depends on many things. A “controlling” appendix may need removal to set free the ileum. (Fig. 2.) A tight kink of the iliac colon may set up so much spasm that the obstruction cannot be overcome by medical means. Surgery must be invoked; the kink must be divided so as to free the bowel; surfaces denuded of peritoneum must then be covered over most carefully to prevent new adhesions during healing. Division of a sharply-kinked splenic flexure is less successful because of its situation—high under the dome of the

THE PERIWINKLE CÆCUM

left diaphragm, where it is difficult to cover raw surfaces. An elongated pelvic colon has been excised on some occasions with end-to-end union; good results have been claimed, but there is an objection which seems to me fundamental: although the severed ends unite perfectly, so as to form a continuous-looking bowel, yet physiological continuity has been broken, because Auerbach's plexus has been divided and a length of it removed. Peristaltic waves cannot bridge the gap. X-ray observations show that fæces accumulate at the gap. After a good-sized mass has distended the bowel up to the "join," some goes through—passively—to the distal section. Then a new and independent peristaltic wave starts in the distal portion and propels the mass into the rectum—not a comfortable process!

Surgical Treatment of Neglected Stasis.—Surgical treatment is necessary also in advanced (neglected) stasis when it has caused an end-result such as a pre- or post-pyloric ulcer (Figs. 11 and 12), pyloric

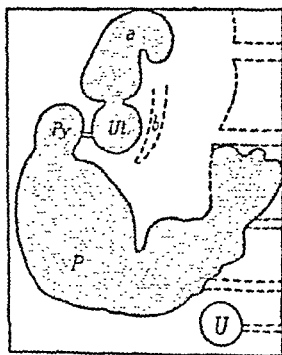


FIG. 11.—Chronic duodenal ulcer (see also FIG. 12).

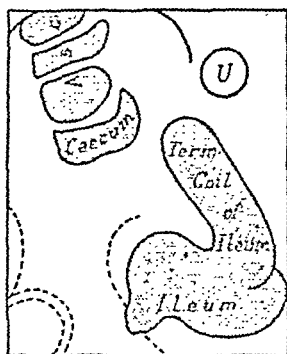


FIG. 12.—Obstructed terminal ileum in same case as FIG. 11; proved—at operation—due to a "controlling" appendix.

stenosis, an affection of the gall bladder or a cancer of the stomach or the intestine. If the colon is diseased beyond repair, its removal (with end-to-end union of

ileum and rectum) is the only measure available.

Extracting the "Winkle" from its Shell.—If surgery be needed, the surgeon may do well to extract the "winkle" from its shell and replace it in the right iliac fossa where it should be. Whether or not to fix it there is a matter he must decide for himself in each case. He must not forget, however, that surgery is but the prelude to treatment—a necessary preamble to render treatment effective. Full advantage should be taken of the weeks of recumbency following operation to encourage the cæcum to stay in its proper place. Posture, enemata and, later, skilful massage and correct diet are among the means to be adopted during recovery from the operation.

Medicinal Treatment.—Medicines are an aid and a great comfort in an emergency, but are best avoided in a chronic complaint such as stasis. There are two exceptions, however, though it may justly be claimed for both that they are not "medicines" or "drugs" in any true sense; they are substances which pass through the alimentary canal in their entirety, unchanged chemically. These two substances are liquid paraffin and colloidal kaolin (kaylene), which latter I introduced to the medical profession in 1923¹; kaylene, in the colloidal form, is a powerful adsorbent of intestinal poisons. It is no destroyer of microbes, but renders them harmless by taking up their poisonous products while it leaves the "friendly" microbes with full ability to carry on their useful work of breaking up the walls of vegetable cells in the large bowel. Paraffin and kaylene together form a soothing and healing combination and render the fæces soft and pliant. True, "drugs" may be needed in the early days of treatment; belladonna in small doses relieves spasm of the intestinal muscle, especially the sphincters; saline aperients, well diluted, may be very helpful in dealing with constipation while a satisfactory diet is being built up.

THE PERIWINKLE CÆCUM

PREVENTION.

Stasis begins in infancy. Bottle feeding or defective mother's milk causes constipation. Straining causes progressive elongation of the pelvic colon. Overfilling of the stomach and transverse colon cause ptosis and deficient peristalsis. Hence the extreme importance of correct hygiene and diet for expectant mothers.

Vitamins and Correct Diet.—Recent additions to knowledge of vitamins and recognition of the supreme importance of the accessory food factors have brought about a clear conception of the rôle of stasis in producing chronic microbic poisoning. Civilization has introduced factory foods, many of which are devitalized; they produce gastric dilatation, catarrh of the colon (colitis), and other pathological changes that can be reproduced in animals by feeding experiments. Devitalized, over-cooked and concentrated foods, when stagnant in the bowel, are attacked by microbes; the resulting toxins poison the bowel-wall, they enter the general circulation and then reach—and damage—every tissue of the body. Recent discoveries regarding ultra-violet rays and basal metabolism have accentuated the importance of sunlight, fresh air, exercise and hygienic clothing as means of preventing the evils of stasis.

Reference.

¹ *The Lancet*, 1923, i, p. 432.

The Treatment of Burns and Scalds by Tannic Acid.

By GERTRUDE HERZFELD, M.B., F.R.C.S.E.

Surgeon to the Royal Edinburgh Hospital for Sick Children and to the Edinburgh Hospital for Women and Children; University Lecturer in Diseases of Children.

THE treatment of burns and scalds by the application of tannic acid was first advocated by Davidson,¹ since when this method has been used exclusively in the Royal Edinburgh Hospital for Sick Children, and we believe that this is a great advance on all previous local applications. Before its introduction, cases of burns and scalds were dreaded by surgeons and nursing staff alike, particularly in children, in whom the case mortality was high, despite every care and attention. The majority are due to scalds rather than burns. The result is that most cases are superficial, generally only second degree; at the same time they are extensive as regards area, and hitherto the prognosis has been bad. On looking through the records of about ten years I find that about 30 per cent. of children admitted to the hospital succumbed to the injury; further, 85 per cent. of the deaths occurred after the lapse of forty-eight hours. It is thus clear that the high mortality rate among children is not due to primary shock, but is caused by the onset of the toxæmic stage, which appears about forty-eight hours after the injury, and is characterized by high temperature, rapid pulse, vomiting and sometimes convulsions, ending only too frequently in death. This toxæmia is in the main part due to the absorption from the injured area of soluble toxins believed to be the result of protein disintegration.

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Further, in cases where the toxæmia was not marked or was successfully overcome, one still dreaded the nursing of the patient on account of the necessity for painful and frequent dressings. Healing was frequently slow, even in the superficial burn, and the scars were apt to be thin and easily injured. In many cases mild sepsis occurred and delayed healing, and it was not at all uncommon for skin grafting to be required, owing to the large area involved. The burns took many weeks to heal, at the end of which time the child was thoroughly nervous, irritable and terrified of being handled.

Innumerable different methods were in vogue, of which perhaps the most popular of recent years were picric acid, ambrine (or its modifications), and adrenaline soaks, but with none of these methods was the toxæmic stage avoidable, and, with the exception of ambrine, all involved many painful dressings.

In considering the treatment of burns and scalds, one aims at the following :—

- (1) Prevention of absorption from the injured tissues.
- (2) Prevention of local sepsis.
- (3) Painless dressing or covering for the burned area.
- (4) Rapid healing with a minimum of scar formation.

In tannic acid we have, I believe, the ideal substance for the attainment of these aims. Its action when applied to the denuded surface of the body is as follows :

(1) The tannic acid produces a local coagulum over the raw surface and thereby renders the products of the burn insoluble, so that no absorption takes place into the general circulation.

(2) By the formation of a practically waterproof and rigid covering over the denuded surface, little or no local sepsis is likely to occur in the majority of cases.

(3) The actual application of the tannic acid is painless and pain-relieving, and no further dressings are

required once the formation of the coagulum is complete.

(4) As a result of the coagulum formation, healing progresses undisturbed beneath the covering thus formed, and the injury to the granulations so often caused by changing dressings is avoided, with the result that healing takes place rapidly. In second degree burns, it has invariably been found that the scar left is superior to that produced by other methods, and no contractures are caused.

Method of Application.—For the purpose of treating burns and scalds, we have used a 2·5 per cent. solution of tannic acid in sterile water, as first advocated by Davidson, but we have gradually modified his actual methods and have entirely given up the use of tannic acid ointment, which he advised for application to the face. The solution of tannic acid *must* be freshly prepared for every application, for tannic acid left in solution is rapidly converted into gallic acid. The simplest method of obtaining a solution of the correct strength is to keep the powder in packages of 110 grains, to be dissolved in a half-pint of water.

In dealing with an individual case the patient must, of course, be treated according to the extent and severity of the burn. When shock is present, this must first be combated by the application of warmth and fluids, and, if necessary, the administration of morphia. It is, however, important to treat the local condition as soon as possible, in order to prevent absorption of toxins. The burned parts should be cleansed with methylated spirit, all blisters should be opened and the overlying epithelium removed, and a final cleansing with ether to dry the parts is advisable. The tannic acid is now applied with an ordinary spray, the whole affected area being treated. Tannic acid has no effect on healthy skin, so that no fear need be entertained of applying too much.

It may sometimes be advisable to administer a

BURNS AND SCALDS

general anæsthetic for the preliminary cleansing and application, but we prefer to do without, though a light gas and oxygen anæsthesia is unlikely to do much harm. The patient is now covered with a cage, into which an electric bulb is placed, so that the burned areas are left uncovered, while at the same time body warmth is maintained. The tannic acid is re-applied in the same manner every hour until the coagulum shows definite signs of forming. The coagulum at first is yellowish and gradually deepens, until after five to eight applications a warm brown colour appears, which varies in depth at different sites. Thereafter no further application is required, but the coagulum will continue to deepen until it is practically black. During this time if necessary morphia is repeated and fluids should be forced by the mouth, rectum and skin. Where the face is burned, the eyes, nose and mouth must be protected from the action of the tannic acid. In those cases where it is impossible to avoid pressure on the affected parts, as, for instance, when both front and back are burned, the tannic acid is applied with a spray, after which a light sterile dressing is applied to those parts which cannot be left exposed. When necessary, and fairly frequently in young children, the limbs will have to be secured by means of a clove-hitch to the sides of the bed, in order to prevent damage to the coagulum.

Once the coagulum has formed nothing further is required in the way of dressings, though occasionally further blisters may form and have to be snipped and treated similarly. The coagulum becomes dry and leathery and deepens in colour day by day.

Application of the tannic acid is painless, and as soon as coagulation occurs all pain is relieved and the patient becomes quiet and restful. In a case which is progressing well, no further treatment is required

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It may sometimes be advisable to administer a

BURNS AND SCALDS

quickly relieved.

(3) The result of the formation of the coagulum is, first, to prevent absorption of toxins; secondly, to lessen the loss of fluid from the raw surface; and thirdly, dressings can entirely be dispensed with.

(4) Healing takes place more rapidly than with any other method, with the result that the patient is kept a relatively short time in hospital. In our experience most patients are discharged in ten to eighteen days.

(5) The scar formation with this method is most satisfactory and rapid. We have not had to skin-graft a single superficial burn since using this method.

(6) Nursing is greatly simplified, provided the child is in hospital or a nursing home. The patient is comfortable throughout and rarely becomes either restless or irritable.

(7) The case mortality, at any rate in children, has improved enormously. In my own experience the percentage mortality has dropped from 38 per cent. to 9 per cent. This point alone would justify the use of tannic acid.

The only disadvantage of this method is that the patients require skilled nursing, in order to ensure that nothing in the way of bedclothes, etc., touches the coagulum. Patients must invariably be admitted to hospital or a nursing home, and cannot be treated as out-patients.

It must be noted that this method is rarely applicable to cases of burns and scalds which have been treated previously for longer than twelve hours by any other method, and once toxæmia through absorption has occurred, tannic acid is powerless to help. Moreover, no coagulum will form after about 24 to 36 hours, so that in order to get the best result in these cases burns should immediately be treated by tannic acid.

Reference.

¹ *Surgery, Gynaecology and Obstetrics*, August, 1925.

excepting that the bedclothes must be carefully kept off the burned area, as the coagulum should not be disturbed until it begins to separate of its own accord, about the seventh to the tenth day.

It is very important that even when sepsis supervenes, no wet dressings should be applied on the top of the coagulum. Davidson pointed out that the application of moisture almost invariably leads to a rise in temperature and symptoms of toxæmia, and this has been our experience also. Should sepsis occur the coagulum must completely be removed before any form of moist dressing is used.

When the coagulum separates it will be found, in the case of second degree burns, that healing is almost complete. The small superficial raw areas occasionally left can be treated by any simple antiseptic ointment.

The most striking result of this treatment is the fact that in the majority of cases the stage of toxæmia is entirely absent, or at most so slight as to give rise to no anxiety. Where formerly the temperature often rose to 103° or 104° on the third day, and the patient was obviously dangerously ill often for many days, we now find that as a rule the patient's temperature does not rise above 99° or 100° , and the general condition remains throughout most satisfactory, even where an extensive superficial burn is present. It is indeed amazing to note how slight the general reaction is, compared with cases in which other methods have been used. In many cases one has no anxiety about the patient after the first twenty-four hours, and the patient himself is comfortable and placid.

To summarize the advantages of this method of treatment, one may state with confidence that it is quite the most satisfactory line of treatment yet tried:—

(1) The drug is easily prepared, provided the tannic acid powder is kept at hand.

(2) Its application is simple and painless, and pain is

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cases in adults and invariably in children, is not a simple error of refraction, but definitely a disease, the condition being essentially due to a morbid process alien to healthy normal development. The old idea that short sight was primarily due to the mechanical result of pressure on the eyeball from the strain of the constant accommodation and convergence in continued close work has now definitely been relegated to the rank of a secondary cause. Similarly, the theory that it was due to the hereditary transmission of a construction fault must also rank as an auxiliary factor in the production of the condition. There is no question that myopia is transmitted through the line of family descent, but hypermetropia is also passed down the generations in a similar manner. The essential difference between the two is that one is the transmission of a pathological tendency and the other of a structural defect.

The development of myopia follows a postnatal fault in the growth of the tissues of the sclerotic, which especially affects the posterior segment of this tunic. This theory was first advocated by Professor Roemer, of Greifswald,¹ and he suggested the term scleromalacia to describe this tissue degeneration, in analogy with the condition in bone tissue known as osteomalacia. In 1921, I published a paper on the results of the eye examination of 30,000 recruits,² and in the conclusions drawn from this vast body of material I found ample evidence to confirm those of Professor Roemer. In 1924, Sir Arthur Keith,³ in a lecture, demonstrated in a convincing and logical manner that a disorder of post-natal development is the true clue to the causation of myopia.

This interference with the normal control of the growth process in the sclerotic is probably due to a fault in the endocrine centres, and is analogous to what occurs in the thyroid or pituitary dysplasias, with the resulting cretinism, acromegaly or other structural or

Eye Disease in General Practice.

By J. KIRK, M.D.

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Ophthalmic Surgeon, Penang General Hospital.*

THIS article in THE PRACTITIONER is based upon experience gained in the course of some thirty years in general practice, both in this country and abroad, during which time the writer also practised as an ophthalmologist. The combination of specialism and ordinary work has many advantages in regard to the diseases and abnormalities of the eye, for the problems of ophthalmology so often involve other morbid conditions and are modified by heredity, past history and environment. The wider one's experience the more evident becomes the fact that a sick eye invariably means a sick body in some respect or other, evident or latent. This sequence is often overlooked or not recognized, and I would like it to serve as the text for the following observations.

The community has in recent years been paying a great deal more attention to the correction of errors of the refractive apparatus, both in children and in adults. This is all to the good if the examination is done efficiently and with judgment, but owing to the rapid development in all the large centres of population of the trade of prescribing opticians, with often a purely business outlook, there are many serious evils to be guarded against. To begin with, myopia—the most crippling and serious of all the defects of the eye, both from the economic and social points of view—is one which the qualified ophthalmologist alone has the training to deal with, for this, in a large number of

cases in adults and invariably in children, is not a simple error of refraction, but definitely a disease, the condition being essentially due to a morbid process alien to healthy normal development. The old idea that short sight was primarily due to the mechanical result of pressure on the eyeball from the strain of the constant accommodation and convergence in continued close work has now definitely been relegated to the rank of a secondary cause. Similarly, the theory that it was due to the hereditary transmission of a construction fault must also rank as an auxiliary factor in the production of the condition. There is no question that myopia is transmitted through the line of family descent, but hypermetropia is also passed down the generations in a similar manner. The essential difference between the two is that one is the transmission of a pathological tendency and the other of a structural defect.

The development of myopia follows a postnatal fault in the growth of the tissues of the sclerotic, which especially affects the posterior segment of this tunic. This theory was first advocated by Professor Roemer, of Greifswald,¹ and he suggested the term scleromalacia to describe this tissue degeneration, in analogy with the condition in bone tissue known as osteomalacia. In 1921, I published a paper on the results of the eye examination of 30,000 recruits,² and in the conclusions drawn from this vast body of material I found ample evidence to confirm those of Professor Roemer. In 1924, Sir Arthur Keith,³ in a lecture, demonstrated in a convincing and logical manner that a disorder of post-natal development is the true cause of the causation of myopia.

This interference with the normal course of the growth process in the sclerotic is probably due to a fault in the endocrine centres, and is analogous to what occurs in the thyroid or pituitary dysplasias, with the resulting cretinism, acromegaly or other structural or

tissue degenerations. The tendency to this abnormality may be inherited, in the same way that gout, asthma, and the various forms of anaphylaxis are inherited, or it may be due directly to any or all of the following causes:—

(1) The absence from the blood of certain essential natural elements—salts or any of the vitamins, and, arguing by analogy, especially vitamin D.

(2) The result of a direct toxæmia, as in the cases which follow the febrile diseases of infancy and especially measles.

(3) It is frequently a sequence of a latent tuberculous tendency or, to use the old term, the strumous diathesis.

We have, therefore, in the treatment of myopia to recognize and deal with factors which infect the whole organism, and we have also to secure the means of prevention. That entails: (1) The securing of healthy conditions in the period of tissue development and growth; (2) the protection of children from the common infectious diseases, and most particularly of all from measles, for this vile complaint is in my experience responsible for a very large proportion of myopia in children, and also for its later development in adolescence; (3) the very constant watching and care from an early age of the members of those families where there is a history of inherited myopia. By working on such lines as the foregoing, and with the coming development of our knowledge in relation to endocrinology and the laws of inheritance, there is every hope that in the near future myopia will cease to be the scourge of civilization and the disaster to so many promising lives, as it has been in the past.

Hypermetropia, as opposed to myopia, is not normally a pathological condition, but the inheritance of a structural defect. It is, however, associated with the important economic disability of internal strabismus,

and monocular amblyopia. In the production of this condition there must evidently be a secondary factor in addition to the hypermetropia. The usual explanation is that the fusion centre is at fault; but why should this fail in one hypermetropic child and not in another? My own experience leads me to believe that the condition is essentially a disease of the civilized races. I found that among the children of the Eastern races, squint, unless secondary to trachoma or other ulcerative conditions, was very uncommon. Here again we must, in my opinion, look for the primary cause of this disease in faulty hygienic conditions—lack of sunlight and fresh air, defective nutritional standards, and toxæmia from the acute infections of children, and most especially measles; that is to say that the conditions favourable to the development of myopia in certain children in others may produce concomitant convergent strabismus.

I should like now to record a few clinical observations on some acute eye conditions. In the treatment of inflammations of the ocular tissues their developmental origin has to be remembered, and that just as in the skin and mucous membrane of the alimentary tract, owing to the excretory function of these organs, toxæmic conditions produce characteristic lesions, so in the eye a similar function exists and similar reactions occur, and there is invariably a systemic dyscrasia to be dealt with, which may be obvious or require a great deal of searching for.

Some of these casual factors are probably of an anaphylactic nature, and are due to the formations of some unknown toxins which are selectively eliminated through the ocular tissues. A toxæmia of this nature I believe to be the origin of certain forms of acute and chronic conjunctivitis, scleritis and episcleritis, and probably also the important factor in the causation of glaucoma.

From the point of view of a family physician as well as that of an ophthalmologist, I have never been

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endocrine secretion and balance.

The practical conclusion from the point of view of the family physician is that the patient in whom we recognize symptoms pointing to a possible development of glaucoma, should be treated on lines minimizing as far as possible poisonous absorptions from the organs of metabolism, and be freed from all strain and mental worry. The future will bring us more exact knowledge both of ætiology and treatment, and with it the power of controlling this disease and other cognate inflammatory reactions.

Finally, I would like to emphasize: (1) The importance of mixed infections in the treatment and pathology of eye disease; and (2) the fact that certain anomalies are made understandable by remembering that often more than one abnormal process is entailed.

An example of the first is trachoma. In my long experience of this disease in the Far East, I found that it was primarily a latent non-acute condition following an infection by a protozoal organism, and the resulting formation of a cell inclusion body and secondary granulations. The trachoma of the textbooks and of ordinary clinical observation is in distinction invariably a mixed infection. In the subacute cases I found the *Morax bacillus* in an almost pure culture. In the acute and severe fulminating varieties the former organism is combined with the Koch-Weeks bacillus and the *Staphylococcus albus*.⁴

A second example is gonorrheal ophthalmia. The gonococcus owes its destructive power in the conjunctival sac to a like mixed infection. An infection by this organism alone as in a gonococcal iritis is essentially a subacute non-suppurative condition.

Thirdly, the parasite of malaria is rarely in itself a cause of ocular trouble, and if such arise in a case of this infection, one must look for the causation to the presence of other pathological organisms or to the

satisfied with the orthodox etiological theories of this disease. Undoubtedly a definite predisposing cause is the possession of a small-sized globe which is unable to accommodate comfortably the growing senile lens. This type of eye, however, is very common, and the immense majority of them never become glaucomatous. In my experience, the disease seems to affect certain types more than others, and especially the nervous, anxious person, and where there is an obvious hepatic diathesis. There is frequently a history of hard toil, strain and worry. Arteriosclerosis is a frequent complication, though I doubt if it has much influence as a causal factor. Generally the patient does not enjoy good health and is not of the long-lived type.

The theory, therefore, that I wish to propose as to the essential cause of this disease, is that the condition is due to an intestinal toxæmia, and that certain chemical poisons are produced which find their channel of elimination in the ocular tissues. We have the two main types. In the one a sudden catastrophic onset like a Jove's thunderbolt from a clear sky; in the other a slow, chronic, insidious march of the disease, with a gradual, almost imperceptible clouding of the sight till the darkness is complete.

In the latter form we have, as the result of the poisoning, chronic degenerative changes in the uveal tract and vitreous, with secondary interference in the normal physiology of the aqueous secretion. These changes are so latent and gradual, that the warning signs of inflammatory reaction are absent.

What is the explanation of the acute form? I think that it is due to an anaphylactic attack in a previously sensitized eye. This sensitization may be represented by very latent early degenerative changes, or the eye may already be definitely affected by chronic glaucoma. Possibly in certain cases there may also be other unknown sensitizing factors, as, for instance, defective

Glycosuria and Cancer.

By J. THOMSON SHIRLAW, M.D.

Upholland, Wigan.

THE idea that cancer is a constitutional disease with a local manifestation has gained strength in my estimation by the fact that, during many years of general practice, I have noticed that patients who have previously exhibited signs of glycosuria have later suffered from cancer. To put it in another way—those glycosurics who have died, have died of cancer. And proof is still forthcoming. A few weeks ago, a patient, who eight years ago was treated by me for a neglected glycosuria, presented himself with a rodent ulcer. I have never known a case of true pancreatic diabetes develop cancer. To put it in the form of a syllogism :—

Glycosuria precedes cancer.

Glycosuria is an error of metabolism.

Therefore, that which precedes cancer is an error of metabolism.

Such correlation of glycosuria and cancer has been too frequent to be a mere coincidence, and I thought that if an idea could be formed as to the nature of the metabolic error in glycosuria, it might help us on our way to an elucidation of the cancer mystery.

In glycosuria, then, sugar appears in the urine, because it is not being burnt—it accumulates in the blood and passes through the kidney membrane. The sugar molecule has been prepared for combustion by the ferment, insulin, as the pancreas is not at fault. Why, then, is it not burnt? As the final oxidation of sugar is only achieved by the simultaneous oxidation of fat, it is obvious that there must be something wrong with the fat metabolism; the fat cannot have been prepared for oxidation, so that the fat-splitting

coexistence of some alien pathological morbid processes. In illustration of the second proposition, one may note that certain forms of neuroretinitis associated with disease of the kidney, as for instance such as occur in pregnancy, scarlatina, trench nephritis and other acute toxæmias, differ essentially in their development and prognosis from the type met with in the chronic varieties of nephritis. The explanation being that in the latter we have the additional factor of arteriosclerosis, and permanent irreparable changes in the vessels of the retina.

In conclusion, it is evident that the divorce of the supervision and treatment of errors of refraction—which so often entail abnormalities and diseases of the eye and of the body complex as a whole—from the trained medical practitioner is a dangerous development, and would seriously interfere with the attainment of a higher standard of national health and efficiency. There is only one solution; in the first place, the public enlightenment and education in the dangers and fallacies of unqualified and commercial optical practice, and secondly, the vital necessity of the provision by the great medical schools of a sufficient number of general practitioners thoroughly trained in ophthalmology; for it is to the general practitioner that the great bulk of this work must come. If this is not done, and there is no reason why it should not be, the inevitable result will be that in the immediate future we shall have the definite entrenchment in the community of a new class of unqualified practitioner.

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ferment must be deficient. In pancreatic diabetes, the converse is true—the fat has been prepared, and is ready for complete metabolism, but the sugar has not, owing to the pancreas being unhealthy. Again, sugar accumulates and is passed by the kidney. We know that in *untreated diabetes*, according to the degree of oxidation of the fat, we may have the condition known as lipæmia and acetonuria—in the former fat appears in large amount in the blood, which is creamy; in the latter, the fat is only partially oxidized and forms acetone bodies.

A short statement of what we know about fat metabolism is now necessary.¹ It has for some time been recognized by bio-chemists that the fats of the body, while acting as stores of potential energy, are, at the same time, important constituents of the living cell and play an indispensable part in its vital phenomena. This intimate association is realized when one studies the effects of the alcohol group of narcotics, such as ether, chloroform, alcohol, and other substances on the cell. These are all chemically different and yet have the same pharmacological properties, proving that they possess an action on protoplasm common to all, namely, on the fats of the cell. Hans Meyer, in 1899, after much research work on the subject, came to the following conclusions:—

(1) All substances that have the power of dissolving in fats or similar compounds, though they may be chemically indifferent, must act upon living protoplasm as narcotics whenever they have access to it. (2) Cells will be liable to this action in proportion as the fats enter into their chemical structure and are the seat of their functions, which is notably the case with nerve cells. (3) This action must depend upon the mechanical affinity of the substances to fat, on the one hand, and to the other components of the cell, principally water, on the other; that is to say, upon the partition

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co-efficient of the substances between fats and water.

It will therefore be seen that the temporary suspension of vital activity induced by narcotics must be due to a physical change in the relationship between the fats and the other cell constituents. During the past year there has been much speculation as to the nature of convulsions, which sometimes appear during ether anæsthesia. I should imagine the explanation is to be found in the solvent action of ether on the fats of the protoplasm.

A case of fat embolism after the administration of ether has been reported.² The condition, too, known as delayed chloroform poisoning, where there occurs a rapidly-induced fatty change in the liver, is in all likelihood due to the same cause. The liver is unable to cope with the too-rapid influx of fat, and is swamped.

Fat, then, is part and parcel of the protoplasm—without it, the cell would die. Even in animals killed by starvation, when all the reserve fat is used up, the fats in the organs and tissues remain constant. These contain the same amount of fat as the corresponding organs and tissues in control animals. As one biochemist puts it: "The fatty molecules die at their posts in an endeavour to save the cell." Leathes, in discussing this phenomenon in the case of the brain, points out that it does not lose weight during starvation, and "this means that the organ which contains the largest amount of what may be called organized fat can dispense with none of it, if it is to live." This organized fat—the "constant element" of the French school—is unsaturated, and consists largely of phosphatides, in contradistinction to the reserve fat, which is saturated, and is known as the "variable element." It is important to note the difference in the degree of saturation of these two, for whereas fats when saturated are

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inactive, the more saturated they are the more unstable they become. Leathes expresses it aptly when he says: "The body stores its powder wet for safety, and dries it only when required for use." A similar process of unsaturation of fat is seen in the vegetable world. During the germination of seeds rich in fat, the seedling, after a certain stage of development, contains a considerable proportion of free fatty acids, which increase in amount as the original fat diminishes.

Turning again to the animal kingdom, it has been ascertained that the liver contains a relatively large amount of unsaturated fatty acids, thereby implying that it is in that organ that the first stage of fat catabolism takes place. Leathes and Meyer-Wedell, in 1920, fed rats with oils of known iodine value. When the animals were killed some hours later, the iodine value of the fatty acids isolated from the liver was found to be higher than that of the fatty acids in the oil-fed, and higher still than the acids in the livers from control, rats. They arrived at the conclusion that it is the function of the liver to render saturated acids unsaturated or to increase the degree of unsaturation of unsaturated acids.

When neutral fat is called up by the physiological process of supply and demand from the reserve depots, it is not at first hydrolysed as it is in the intestine, but is taken direct to the liver, where it is converted largely into phosphatides, and the fatty acids unsaturated. The association of phosphoric compounds with fats is important, as they play an important part in the intermediary catabolism of carbohydrates. The fat is now in a form that is unstable, and in this form is ready for the maintenance and repair of the tissues. Further oxidation demands the simultaneous oxidation of carbohydrate, which, in the healthy individual, has undergone its first stage of catabolism at the hands of

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insulin. Both lots of firewood have been dried and are ready to be set alight.

How ingenious the human machine is! It disposes of its supply of fuel in the most economical manner. Instead of throwing it all on the fire and having a huge furnace, which would scorch its tissues, and soon burn itself out, it adds little by little as it is wanted, just to keep the fire alight. It is stored, too, more safely than in a magazine, for it cannot become lit without an added complement, namely sugar, and even these together will not burn without previous preparation of both.

The fats, after being unsaturated in the liver, are intimately built into the organization of the living cell and enter into its vital processes. Not only do they take a share in the structure of the cell itself, but they take also a large part in the formation of the cell envelope—a membrane which is specifically permeable to some molecules or ions, and specifically impermeable to others. But this permeability varies, and it is "The extraordinary properties of selective permeability, alternating with moments of impermeability, on which so many physiological functions of the cell and of every kind of cell, ultimately rests. Herein lie the mysteries of physiological absorption and secretion of the division of cells and nuclei." Leathes considers that the fatty acids are not distributed anyhow in the protoplasm of the cell but form a multilocular spongework of bimolecular films on which cohesion largely depends.

I believe that a pre-cancerous condition is a state of starvation of the organized fat of the cells of the tissues, which must profoundly affect their normal metabolism. This deficiency will lessen in the protoplasmic particles the power of cohesion, which is the most powerful obstacle to the operation of chemical affinity. Anything which diminishes the cohesion of bodies promotes their capacity for chemically combining with each

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other. It follows that growth, which is the result of chemical changes in the cells of the tissues, will be accelerated in proportion to the increased rate of chemical change, and a tumour results. When cancer develops it will naturally first appear in those cells which, by previous irritation and more rapid repair, have too been exhausted of their fats. This exhaustion brings about a molecular disturbance—so that the protoplasmic molecules, instead of assuming a normal and definite polar configuration, become arranged in a random manner. The cell envelope, too, consisting as it does largely of phosphatides, will be similarly disorganized. One might think of it as a bursting of the floodgates at their weakest point—the protoplasm being allowed to sally forth, form irregular unions and multiply illegitimately. Some of the nomadic cells are washed into the lymph stream and cause metastases. They cannot be resisted—the defending cells are not in a position to do so as they have hardly enough fatty supplies for their own needs.

It may be asked, Why, if cancer arises from an error in the metabolism of fats, does sugar not appear in the urines of patients so suffering? I cannot say that I have made systematic daily examination of these urines, and it is just possible that sugar does appear intermittently. In my series of cases of glycosuria, sugar was not always present—in one case it appeared on a single occasion, and this man died of epithelioma of the sigmoid flexure. It may be that the amount of ferment present is on the border line—just enough to prepare the fats for combustion with the sugar but not enough to supply the needs of the tissue cells. Normally, the amount of fatty acids in the blood serum is three or four times the quantity of sugar present, and the modern conception is that each gramme of sugar completely metabolizes four grammes of fat. I do not say that all people who have at some time had

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glycosuria develop cancer. There must be a previous irritation of the site where the tumour develops. One need not recount examples of such irritation, but I should like to relate how seven cases of epithelioma occurred simultaneously in my practice in the past year, all within a radius of one mile. Four were in the mouth or fauces, two in the rectum, and one in the liver. In all the cases, beetles were present in the houses, with the exception of the last mentioned, who had intermittent glycosuria. The exciting cause in the other six patients was most probably a nematode worm.

This conception of the development of cancer will explain the condition known as cancerous cachexia, which resembles the cachexias of other metabolic diseases. Death does not always directly result from the cancer, but from exhaustion of the cells of the organs, due to a deficient supply of unsaturated fatty acid compounds. It may also explain why it is difficult to transplant a cancer from an animal of a species into an animal of another species, as the fat of an animal is characteristic of the species to which it belongs. The occasional success obtained by the administration of organic extracts, such as thyroid, is, I should imagine, due to the lipase-stimulating effect of these substances.

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time, when earlier help would have been on a par with the best surgical work of the day. What has been done in surgery can be done in midwifery, if the practical and not the theoretical forces are allowed to carry on their way.

For the last twenty years it has been my practice to have my patient prepared as follows: A bath, an enema, the patient shaved and the parts scrubbed up with a germicidal soap, such as mercuric-iodide soap. The obstetrician—his arms stripped to the elbow, and hands and arms scrubbed with a boiled nailbrush and mercuric-iodide soap. This to be repeated every time the patient is examined. Antenatal examinations I insist on; and, of course, the urine is examined. I never give chloroform till the os is fully dilated, and then lightly with each pain if progress is being made, and full anæsthesia when the head can be controlled by the hand at the outlet. I have no use for chloral. If there is delay after full dilatation for two hours, or more in a multipara, I give chloroform and use forceps, always removing them when the head can be controlled by the hand. In a primipara I wait longer. In cases of persisting occipito-posterior I give a full anæsthesia and turn, after full dilatation. This is a manœuvre which is very much neglected because of its supposed difficulty, but in practice it is extremely easy, and needs no force. A point of importance in turning is to keep your knuckles turned towards the child and away from the uterine wall; this is not mentioned in the textbooks. To use forceps on a persisting occipito-posterior is wrong, and it is very seldom that forceps are required on the after-coming head in turning, and this presents no difficulty. The bogey of extended arms in turning exists mostly in books.

I consider the use of Champetier de Ribes' bag is excellent, and this frequently changes an ugly case, such as early rupture of membranes with a thick cervix,

The Practice of Midwifery: An Expression of Opinion after Forty Years of General Practice.

By A. Z. C. CRESSY, M.R.C.S., L.S.A.

Honorary Surgeon, Carshalton and District Memorial Hospital.

MIDWIFERY in my early days was very primitive in comparison with the present time. Cleanliness was practised, but asepsis was unknown. To expose the patient was unthought of; the patient was examined and delivered under the bedclothes; the bowels were not attended to. Forceps were mostly straight and great force was used; cause of delay was not sought for, and help given only when the woman's power gave way.

The wheel of time turned, and much more help was given, but asepsis was unknown, hence the disrepute which has become attached to early interference. Surgery was in the same case, until asepsis came into the field. Surgeons grasped it up to the hilt, hence the glorious position of surgery at the present time; but in the practice of midwifery the necessity of asepsis has not been brought up to the same pitch. What surgeon would dare to operate under the conditions in which the majority of cases of childbirth are treated at the present time?

The Ministry of Health, with its obsession for midwives, has gone back to the days of my youth when Nature was left to do its best or worst and interference only took place at the worst time—the most dangerous

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time, when earlier help would have been on a par with the best surgical work of the day. What has been done in surgery can be done in midwifery, if the practical and not the theoretical forces are allowed to carry on their way.

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I consider the use of Champetier de Ribes' bag is excellent, and this frequently changes an ugly case, such as early rupture of membranes with a thick cervix,

into one of extreme simplicity. To prepare Champetier de Ribes' bags, "as they do not stand boiling," wash them with a sterilized brush and mercuric-iodide soap and then place them in a strong solution of lysol for ten minutes and rinse in sterilized water before use. De Ribes' forceps should always be used for their introduction. Tough membranes are a frequent cause of delay and are not ruptured early enough. Membranes with no water between them and the head require rupturing, as they cause indefinite delay.

We have read a lot in the medical journals lately about split cervix at post-natal examinations; the cause is invariably put down to instrumental delivery. This is not just. I have seen many a split cervix post-natally when the delivery has been normal, and the only time that forceps could be the cause is when they are improperly applied, before dilatation is complete.

In antenatal work I have found one item very useful in accounting for an unexpected delay, and that is the width of the head between the two parietal eminences of the father or mother. Many a time have I seen the father's head for the first time when I came downstairs after a forceps case.

In a series of 674 consecutive cases, from 1915 to 1925, I had 316 normal cases, 289 forceps, 59 turning, and 10 Cæsarians, and had no sepsis in any one of them. De Ribes' bags were used 63 times. I had two deaths on the tenth day from pulmonary emboli: one a multipara, a normal case almost over when I arrived; and the other a primipara, a Cæsarian section for profuse hæmorrhage, the uterus distended and stony hard with internal bleeding—she did well and gave no anxiety, but expired suddenly when lifted on to the bedpan. Both cases were more in the hands of God than man.

If the Ministry of Health turned its attention to

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how it could be of use to the practitioner in carrying out his obstetric practice, instead of excessively lauding the midwife, I would suggest that the public authorities should place drums of sterile gowns, towels, pads and dressings at the service of all practitioners; this would be a grand step forward in a line with surgery. Also they might place the Obstetric Specialist for Puerperal Fever and Pyrexia (a very far-fetched and useless appointment) at the disposal of any practitioner in difficulty over an obstetric case in the same way that midwives are helped, the local authorities paying the fee; and local hospitals could be asked to take in cases presenting difficulties known before the time of delivery and obstetric emergencies, at a suitable fee, such as eclampsia, placenta previa, contracted pelvis, accidental hæmorrhage (most of which require surgical aid), and minor cases, varicosity of vulval veins, displacements, and persisting occipito-posterior cases.

I consider obstetrics a fine art and, carried out on surgical lines, a safe and humane practice. I agree that a normal case progressing should be left to Nature, with a whiff of chloroform at the last, putting twenty-four hours down as the limit. How few women are normal nowadays! When one hears of cases being allowed to go on for days, I consider it is cruel and inhuman treatment. It is surprising that the Ministry of Health appears never to have applied to the senior men of the profession in general practice to give their experience to help to solve the problem of maternal mortality.

into one of extreme simplicity. To prepare Champetier de Ribes' bags, "as they do not stand boiling," wash them with a sterilized brush and mercuric-iodide soap and then place them in a strong solution of lysol for ten minutes and rinse in sterilized water before use. De Ribes' forceps should always be used for their introduction. Tough membranes are a frequent cause of delay and are not ruptured early enough. Membranes with no water between them and the head require rupturing, as they cause indefinite delay.

We have read a lot in the medical journals lately about split cervix at post-natal examinations; the cause is invariably put down to instrumental delivery. This is not just. I have seen many a split cervix post-natally when the delivery has been normal, and the only time that forceps could be the cause is when they are improperly applied, before dilatation is complete.

In antenatal work I have found one item very useful in accounting for an unexpected delay, and that is the width of the head between the two parietal eminences of the father or mother. Many a time have I seen the father's head for the first time when I came downstairs after a forceps case.

In a series of 674 consecutive cases, from 1915 to 1925, I had 316 normal cases, 289 forceps, 59 turning, and 10 Cæsarians, and had no sepsis in any one of them. De Ribes' bags were used 63 times. I had two deaths on the tenth day from pulmonary emboli: one a multipara, a normal case almost over when I arrived; and the other a primipara, a Cæsarian section for profuse hæmorrhage, the uterus distended and stony hard with internal bleeding—she did well and gave no anxiety, but expired suddenly when lifted on to the bedpan. Both cases were more in the hands of God than man.

If the Ministry of Health turned its attention to

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graphy. The treatment should be carried out in conjunction with the diet recommended by Minor and Murphy. The authors note that Lemaire has obtained analogous results using kidney in the same doses as liver. Blood transfusion should be reserved for severe cases which do not respond immediately to the liver treatment. Injections of insulin appear sometimes to aid the action of the liver. —(*Gazette des Hôpitaux*, November 17, 1928, p. 1,621.)

The Treatment of Intestinal Intoxication.

H. J. Bartle observes that the symptoms of intestinal intoxication are due to abnormalities of function rather than to gross pathological changes. Contributing factors, such as visceroptosis and minor pathological states along the digestive tube from teeth to anus, must be rectified before a cure can be hoped for. The investigation of these conditions, neurological, renal, and cardiovascular abnormalities, may tax severely our diagnostic acumen, but a complete study of the patient should be made before treatment is instituted. Treatment must be directed towards detoxication, prevention of further intoxication, and tonic building. Drugs are altogether a secondary consideration. Patients must be taught how to eat, how to live, how to work, and how to play.—(*Medical Journal and Record* [New York], November 7, 1928, p. 446.)

The Treatment of Intraspinial Tumours.

D. Petit-Dutaillis states that the results of laminectomy for intraspinal tumours depend on the localization of the tumour, on its histological nature, and on the duration of the time that it has been present. The late results of treatment are bad in intramedullary tumours, but good in intradural tumours; they are bad in extradural tumours, because these tumours are usually malignant in character. Any improvement in the treatment of intraspinal tumours depends largely on their being recognized sufficiently early by the general practitioner.—(*Journal de Chirurgie*, August 1928, p. 129.)

The Treatment of Scarlet Fever.

P. Nobécourt, R. Martin, P. R. Bize, and A. Laffaille publish the results of a study of the value of serotherapy in scarlet fever carried out during the past year. They come to the conclusion that scarlet fever antiserum produces marked improvement in the toxic condition if administered early, but it has little or no effect in the suppurative complications and secondary infections associated with scarlet fever. The antiserum is apparently also of real value in bringing about passive immunity, but this immunity does not appear to last more than three or four weeks.—(*La Presse Médicale*, September 22, 1928, p. 1,201.)

Digitalis in the Treatment of Heart Conditions.

W. Scholz suggests that digitalis is often prescribed for patients without the proper indications for its employment. In heart

Practical Notes.

The Treatment of Symptoms of the Menopause.

J. T. King and E. Patterson publish a study of the effects of ovarian preparations on symptoms of the menopause. Up to the present there has been very little accurate observation of the results of ovarian therapy in the presence of control cases treated in other ways. In this study, patients suffering from symptoms resulting from the menopause received physical examinations, simple laboratory examinations and basal metabolism determinations. They were treated empirically with some ovarian substance (corpus luteum, whole dried ovary or follicular extract), with bromide or with phenobarbital. Some patients received several of these forms of treatment at various times, an attempt being made to discover the preparation that seemed to do them the most good. The conclusions which the authors arrived at were that corpus luteum and whole ovary by the mouth, and follicular extract subcutaneously, are probably useless in the relief of symptoms of the menopause. Bromide or phenobarbital or a combination of the two is distinctly helpful in the treatment of such symptoms, probably not specifically, but as general mild sedatives. Corpus luteum may raise a low metabolic rate in a patient at the menopause, but this effect is not sufficiently striking or constant to warrant definite conclusions. Fresh whole gland and follicular extract seem to have no significant effect on basal metabolism.—(*Journal of the American Medical Association*, November 10, 1928, p. 1,423.)

The Prevention of Epididymitis in Prostatectomy.

M. Meltzer points out that the occurrence of epididymitis some time during the course of a prostatectomy is a most distressing and undesirable complication; it occurs in from 20 to 40 per cent. of cases, whether the operation is done perineally or suprapubically. For the prevention of this complication the author recommends bilateral vasectomy, a minor surgical procedure. Vasectomy, in his opinion, is more advisable than vasoligation, which is sometimes recommended, as there is no chance of the ends anastomosing with each other. The operation is best done by the open method, and both vasæ can be ligated in about fifteen minutes under local anæsthesia; it should be done whenever the patient is admitted to hospital before any other procedure whatever.—(*New York State Journal of Medicine*, November 1, 1928, p. 1,290.)

The Treatment of Pernicious Anæmia.

J. Sigwald and P. Chêne recommend the method of Whipple (the daily ingestion of 200 to 250 grams of the liver of veal, beef or mutton) to the exclusion of all others in the treatment of pernicious anæmia, and conclude their article with a lengthy and useful biblio-

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graphy. The treatment should be carried out in conjunction with the diet recommended by Minor and Murphy. The authors note that Lemaire has obtained analogous results using kidney in the same doses as liver. Blood transfusion should be reserved for severe cases which do not respond immediately to the liver treatment. Injections of insulin appear sometimes to aid the action of the liver. —(*Gazette des Hôpitaux*, November 17, 1928, p. 1,621.)

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conditions of nervous origin, for example, it is indeed harmful and not helpful. In angina pectoris and cardiac asthma it is likewise of no value, and it is not needed in heart defects so long as the heart maintains its strength. It gives better results in heart weakness caused by mitral valve disease, but it is no longer considered to be contraindicated in insufficiency of the aortic valve, though it is better in the latter condition when given with atropine to combat the slowing of the pulse caused by digitalis. The supposed evil cumulative effect of digitalis has been, in the author's opinion, greatly exaggerated.—(*Wiener Klinische Wochenschrift*, September 6, 1928, p. 1,283.)

The Treatment of Severe Streptococcal Infections.

E. Manoussakis is of opinion that cases of severe streptococcal infection (such as erysipelas, meningitis and septicæmia) are markedly benefited by the transfusion of blood from individuals who have previously been vaccinated with streptococcus toxin. The author states that he has found this of greater value than treatment with convalescent serum; the only difficulty is the finding of volunteers to submit to a course of streptococcal vaccines and then to act as blood donors.—(*Bulletins et Mémoires de la Société Médicale des Hôpitaux*, October 25, 1928, p. 1,412.)

The Injection of Hæmorrhoids.

H. Bonheim discusses the relative advantages of the injection method of treating hæmorrhoids over operative procedures. He is of opinion that it is the method of choice. The technique is so simple that the injection can be carried out in the patient's own home; no preparation of the patient is necessary and no after-treatment is required; the injection is painless and defæcation is possible directly afterwards; finally, the injection method can be performed on patients in whom operative measures would be contraindicated owing to their bad general condition. Dr. Bonheim injects the sphincter ani with a local anæsthetic and then injects each pile with $\frac{1}{2}$ to 1 c.cm. of 96 per cent. alcohol, injecting the higher internal ones first, as if the outer ones were first treated the initial swelling might obscure the view of those higher up. This swelling lasts only a very short time and by the next day the piles have become completely shrivelled up. Occasionally it may be necessary to reinject on the following day one or two which have not shrunk sufficiently, but this is a rare occurrence. Dr. Bonheim has never had a case in which piles have recurred when treated by this method.—(*Deutsche Medizinische Wochenschrift*, November 2, 1928, p. 1,844.)

The Treatment of Acne Vulgaris.

E. Langer draws attention to the fact that acne vulgaris is in nearly every case associated with some general disorder of metabolism which may be due either to lack of balance between the various endocrine organs or to gastro-intestinal disturbances. The

Preparations, Inventions, Etc.

SPIRELLA CORSETS.

(Letchworth: The Spirella Company of Great Britain, Ltd.)

Although medical practitioners universally condemned the old-fashioned stiff-boned, tight-laced corset, and medical influence was foremost in aiding woman to escape from its thralldom, few practitioners realize the development in corsetry of recent years. The modern Spirella corset is a supporting garment, designed to work in unison with the muscles of the body, conform to its bony structure, and aid Nature in a normal functioning of all the organs. It affords the degree of control and support required from the standpoint of figure lines, poise, and the correction of pathological conditions which can be relieved by proper support. If properly selected and adjusted, the modern corset will in most cases do all and often more for a woman's figure than a so-called surgical belt can do. The essential feature of the Spirella corset is in its design, which gives abdominal uplift and support without compression, and does not restrict the action of the diaphragm. The basis of the corset is the patent non-corroding steel-wire supporting stay which permits the design, being flexible in every direction yet never taking a permanent bend. The Spirella Company manufactures 475 different models of the modern supporting garment, including various types of corset, girdle, brassière, brassière-girdle, abdominal belt, young girl's girdle and bandeau, obesity corset, and maternity garment; certain types have been designed to aid in the correction of various forms of ptosis, to give abdominal support for post-operative cases, support in suitable cases of inguinal hernia, and for spinal curvature cases where the conditions can be relieved through spinal and abdominal support. Spirella corsets are not sold in the shops, but are made to order on the advice of a trained corsetière (of whom there are some 5,000 throughout the country), who measures and fits the customer in her own home, and who works when necessary in co-operation with the customer's medical practitioner. The factory where the corsets are made is a model of its kind; it consists of an airy and well-lit group of buildings in the garden city of Letchworth, where the hundreds of employees appear to be cared for with almost grandmotherly solicitude.

HANOVIA KROMAYER LAMPS.

(Slough: British Hanovia Quartz Lamp Co., Ltd.)

We have received a handbook on the Hanovia Kromayer lamps for local ultra-violet therapy which contains much of interest to every practitioner. It is divided into two sections: the first

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MARCH

1929

The Value of Sea Voyages in Health and Disease.

(1)

By SIR DANIEL J. P. McNABB, K.B.E., C.B., L.R.C.P., M.R.C.S.

*Surgeon Rear-Admiral, R.N. (Retired) ; Surgeon to the Atlantic
Transport Company.*

FROM the point of view of healthy persons, there is no more reason why they should anticipate any bad result from a voyage across the Atlantic in a modern liner than there would be in transferring from their own homes to a well-appointed hotel for a similar period. In this consideration I am excluding sea-sickness, which may or may not affect the individual according to weather considerations and personal idiosyncrasy.

During such voyages as these ships make it is quite possible to live a normal healthy life. Every effort has been made to ventilate the ships well so that even in the most severe winter weather, when all ports are obliged to be shut, an adequate supply of fresh air is available. In the summer, when the ship has to take a route leading into the warm currents, it is not so

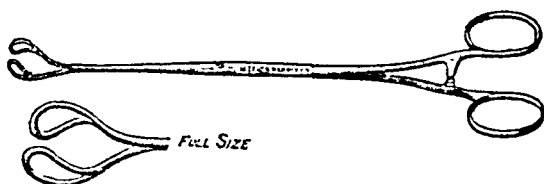
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dealing with the outfit and accessories, and the second consisting of abstracts from medical literature showing the value of local ultra-violet therapy in dental surgery, dermatology, gynæcological and genito-urinary diseases, ophthalmology, oto-rhinolaryngology, surgery, and in medical conditions such as sciatica and arthritis. The Kromayer lamp is a compact unit which can be installed in any practitioner's consulting-room, operates on ordinary domestic electric supply and wiring, and is simple in manipulation. It thus places the entire range of local ultra-violet treatment at the disposal of the general practitioner. The booklet is well illustrated with pictures of the different models and methods of local application.

A PAIR OF FORCEPS TO SIMPLIFY RAMMSTEDT'S OPERATION FOR CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.

(London: Messrs. Allen and Hanburys, Ltd., 48, Wigmore Street, W.1.)

Mr. G. D. F. McFadden, F.R.C.S., of Belfast, writes: In performing Rammstedt's operation for a case of hypertrophic pyloric stenosis, undue delay and increase in shock are frequently caused by the intestine and omentum protruding from the wound. This protrusion is due to the size of the incision necessary for the fingers to grasp the pylorus and to the light anæsthesia of gas and oxygen, which is the anæsthetic of choice. To eliminate these difficulties and simplify the operation I have devised a special pair of forceps which are very useful. These forceps have their grasping ends shaped like a pair of midwifery forceps and are lightly constructed to prevent any harm being done to the tissues. The handles are



fitted with a ratchet, the first teeth of which lock before the grasping ends are in contact, the other teeth taking purchase as the forceps are closed. In this way, the varying size of the hypertrophied pylorus in infants is allowed for. The forceps are made with a curve to allow the handles to lie flat on the abdomen when the pylorus is pulled up into the wound. With this instrument the peritoneum need only be incised sufficiently to admit one finger. The finger is passed down to the pylorus. The forceps held in the other hand are then passed along the finger to the pylorus, which is grasped and pulled out through the wound. No other tissue has an opportunity to protrude. When the pyloroplasty is completed, the pylorus is allowed to drop back and the incision in the abdominal wall closed.

VALUE OF SEA VOYAGES

fresh both at London and New York, and by maintaining it at a temperature one degree above freezing point it is possible to preserve its freshness to the end of the nine-day voyage.

There is no doubt in my mind that, on first coming on board, a great many people eat more than is good for them. It may be the novelty of the scene or the stimulus provided by the fresh air, or again, the food may be put before them in a way which attracts them; but the fact remains that quite a considerable proportion eat too much, certainly at first, or until they are warned, by some internal discomfort, of the necessity for restraint. The same holds good in the matter of alcoholic stimulants. No doubt a certain exhilaration and the emotional disturbance due to saying good-bye to friends are responsible for this unwise indulgence at first, but after that there is no reason whatever why a human being should behave differently in the matter of alcohol on board a ship from what he is in the habit of doing on shore. In some cases, with regard to both food and drink, I would even venture to say that seasickness at first is a blessing in disguise as it enforces an abstinence which is not only not harmful, but is actually beneficial, though it would be extremely difficult to get the sufferers to regard it in that aspect.

A winter voyage across the Atlantic in one of these vessels need deter no one who does not mind a little rough weather. While the interior of the passenger accommodation is well heated (in fact, according to British tastes it is over-heated), yet it is always possible to get out on some portion of the deck. During the four years in which I have been going to and fro across the Atlantic there has not been a single day when it has not been possible to get out on some open-air part of the deck.

For those who consider that a hectic life is a normal one, I would suggest a ship which caters for that style

easy to maintain an equable temperature even with the forced draught, but in all cabins electric fans are supplied which in most cases remove the effects of the heat, and in all cases mitigate it. To a large extent the leading of a normal life is in the passenger's own hands. Adequate space is provided for open-air exercise, both mild and strenuous, on the promenade and other decks, and for those who are devoted to or prefer dancing as a form of exercise, there is ample space with a good floor in the reception room, or, in the warm weather, on the promenade deck.

The food supplied is simple but varied and well cooked, and it seems to meet the requirements of the great majority, though there are always a few who clamour for some delicacy which they profess to be addicted to. On two points there appears to be a prevalent erroneous idea. One is that it is not safe to eat fish after a couple of days at sea. It is curious, in view of the universal use of cold storage, that this idea should still prevail. I have come across it frequently and have had to explain that fish, like other foodstuffs, is carried frozen, so that no deterioration can take place. Even then I have noticed a hesitation which only disappeared after I had partaken of the article myself without disastrous results.

I may say that the greatest care is taken, in the first instance, in obtaining only provisions of the highest quality, and the storerooms and refrigerating plant are admirably adapted to preserving these provisions in the good condition in which they were brought on board. A similar suspicion to that concerning the fish appears to exist with regard to the milk. Frequently when I have suggested fresh milk as an article of diet I have been met with incredulous protests, in the firm belief that all milk on board ships is either made from milk powder or else tinned. It seems to surprise many people that milk is taken on board

VALUE OF SEA VOYAGES

first type is the prolonged convalescent from influenza (catarrhal), with or without broncho-pneumonia. Many of these cases have passed through my hands and without exception have benefited considerably, the great majority having got rid of their symptoms before the end of the nine-day voyage. Certain individuals have been so impressed by this that they make a practice of embarking on one of these ships at the end of the winter or beginning of spring for the sake of the benefit to be derived from the round voyage of twenty-three days.

Another class is amongst those who have been harassed by business or other worries or who have been working under high pressure, with probably irregular meals and irregular sleep. These usually improve with the removal of the cause and the peacefulness of the routine on board. But it is frequently the case that prior to coming on board they have resorted to self-medication, and that situation has to be cleared up before any good can be expected. Women find a great relief from the pressure of both social and domestic affairs.

Those who suffer from gastric or gastro-intestinal abnormalities are not by any means so satisfactory. In most cases they are addicted to over-indulgence, for which they find ample scope on board, or else, through brooding on the subject, they become food faddists, and are unable to find anything on board to suit their disordered tastes. One type which has frequently come to my notice consists of women, chiefly young girls, who have been touring the Continent. Apparently they have been unable to adjust their tastes to the food supplied in the various countries, with the result of loss of appetite, loss of weight, and, ultimately, a mild but persistent form of gastritis. No doubt prolonged and hurried travelling with irregular meals and irregular opportunities for evacuation have con-

of thing. But there are ships in which every attempt is made to provide reasonable comfort and amusement, and in that respect I consider that they are eminently suited to the needs of the average healthy and healthy-minded traveller, with the added satisfaction of meeting many similarly disposed fellow travellers.

So far I have been dealing with those who are in good health. With regard to those who are suffering from, or are convalescent from, various diseases, there are naturally many limitations. In the first place, I would suggest as a general rule that where one would hesitate to transfer a patient from his home to a hotel (not a hospital), equally, if not more so, one should be deterred from transferring him to a ship. Undoubtedly cases arise where the extreme anxiety of the patient to return home may justify such proceedings, but it is unusual, and each case should be considered on its merits and with due regard to the experience of the medical officer of the ship selected.

I can recall at least two cases of acute illness, in both of which the patients masked their symptoms until they had got safely on board. One was a case of influenza (intestinal), and the other one of pneumonia. Both occurred during the winter months and were subjected to particularly bad weather conditions. The influenza case was landed safely in New York and recovered completely. The pneumonia case achieved his crisis during a whole gale in December and was so far advanced in his convalescence as to be married nine days after arrival.

I mention these two cases to show that serious illness can be successfully dealt with amongst passengers, and not with a view to encouraging similar adventures. Mental cases, and also all cases of infectious or contagious disease, must be excluded.

There are undoubtedly certain types of cases which respond satisfactorily to a sea voyage across the Atlantic. I am referring only to those who put themselves in the medical officer's hands and whose treatment is watched and regulated from day to day. The

VALUE OF SEA VOYAGES

first type is the prolonged convalescent from influenza (catarrhal), with or without broncho-pneumonia. Many of these cases have passed through my hands and without exception have benefited considerably, the great majority having got rid of their symptoms before the end of the nine-day voyage. Certain individuals have been so impressed by this that they make a practice of embarking on one of these ships at the end of the winter or beginning of spring for the sake of the benefit to be derived from the round voyage of twenty-three days.

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tributed largely to this, but it is surprising how quickly they recover with regularized feeding and attention to normal functions. Very young children who are taken touring with their parents frequently suffer from this form of gastritis, but once on board and put under treatment they speedily recover.

Alcoholic patients are entirely unsuitable for sea voyages. The opportunities for indulging their craving are too many. The only hold one can get over them is to get them to sign a paper restricting themselves to an allowance of alcohol daily which may be reduced at the discretion of the surgeon. The bar steward has orders to act on this alone, but even with this restraint unwise friends step in and destroy the good work.

During the four years I have been acting as medical officer of an Atlantic liner, the number of passengers (first-class only) which has been carried is 11,280. In the following table I give a list of the various diseases which have come under my care amongst the passengers in that period:—

Disease of digestive system	135	Influenza ..	..	8
Disease of skin and connective tissue	41	Disease of ear ..	..	12
Bronchial catarrh	35	Disease of kidneys ..	..	4
Disease of bladder	6	Syncope ..	..	2
Disease of eyes	14	Pneumonia ..	..	1
Tonsillitis	8	Myxœdema ..	..	1
Fibrositis	28	Old injury ..	..	6
Naso-pharyngeal catarrh ..	114	Bronchiectasis ..	..	1
Heart disease	8	Teno-synovitis ..	..	1
Laryngeal catarrh	22	Neuritis ..	..	5
Asthma	3	Purpura ..	..	1
Insomnia	9	Disease of teeth ..	..	12
Alcoholism	14	Mental disease ..	..	2
Neurasthenia	17	Disease of uterus ..	..	1
Arterio-sclerosis	4	Measles ..	..	1
		Urethritis ..	..	2

The Value of Sea Voyages in Health and Disease.

(2)

BY ROGER P. STEWART, M.B., CH.B., M.R.C.S., L.R.C.P.
Surgeon to the Bibby Line.

HOW often "Take a sea voyage" is a formula prescribed by a practitioner without sufficient direction as to which particular voyage he wishes his patient to take, its duration, when to take it, or even as to the personal routine, dietary, exercise, etc., his patient is to observe on that voyage. All these points are of enormous importance when a sea voyage is in contemplation. The probable reason for this lack of exact direction is because the average practitioner has very little experience of life at sea and is somewhat hazy as to the various routes followed, the climatic and thermal changes encountered, and the resultant effect on the patient. He vaguely knows that a sea voyage is a good tonic and that certain pathological conditions are improved by one. Beyond this he is rather doubtful, and hardly knows where to turn for further information.

I propose to confine my remarks mainly to the therapeutic value, or otherwise, of a voyage to the East (the one of which I have had the greatest experience), to the type of case that does, in my opinion, definitely improve by taking such or part of such a voyage, and finally strike a note of warning as to those cases who should avoid a voyage to the Far East and those who should avoid any voyage at all if they possibly can. The value of a sea voyage to those in health is scarcely necessary to stress. The rejuvenating effect of the

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tributed largely to this, but it is surprising how quickly they recover with regularized feeding and attention to normal functions. Very young children who are taken touring with their parents frequently suffer from this form of gastritis, but once on board and put under treatment they speedily recover.

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By ROGER P. STEWART, M.B., CH.B., M.R.C.S., L.R.C.P.
Surgeon to the Bibby Line.

HOW often "Take a sea voyage" is a formula prescribed by a practitioner without sufficient direction as to which particular voyage he wishes his patient to take, its duration, when to take it, or even as to the personal routine, dietary, exercise, etc., his patient is to observe on that voyage. All these points are of enormous importance when a sea voyage is in contemplation. The probable reason for this lack of exact direction is because the average practitioner has very little experience of life at sea and is somewhat hazy as to the various routes followed, the climatic and thermal changes encountered, and the resultant effect on the patient. He vaguely knows that a sea voyage is a good tonic and that certain pathological conditions are improved by one. Beyond this he is rather doubtful, and hardly knows where to turn for further information.

I propose to confine my remarks mainly to the therapeutic value, or otherwise, of a voyage to the East (the one of which I have had the greatest experience), to the type of case that does, in my opinion, definitely improve by taking such or part of such a voyage, and finally strike a note of warning as to those cases who should avoid a voyage to the Far East and those who should avoid any voyage at all if they possibly can. The value of a sea voyage to those in health is scarcely necessary to stress. The rejuvenating effect of the

bracing sea air, the deck games, music and dancing, the spirit of camaraderie on board is known to all. No better tonic is possible to the tired, but otherwise healthy, business man than a two or three weeks' voyage, say to Marseilles and back, in a full modern liner; then the *joie de vivre* around him is necessarily infectious. What is of more general interest is the effect of such a voyage as the one I describe on the sick, and I shall now turn to this aspect and treat it in detail.

As regards the line and its itinerary, the steamers are oil driven and carry only first-class passengers, so that the whole ship is free to all—a point of first importance in the confinement of a long voyage. The upper, or boat deck, is free from games, and no children are allowed on it, so that the nervous patient, or one who is travelling for rest and quiet, can here find sanctuary—another point of vast importance on a voyage, and it is a feature which I believe is by no means universally found. The ships call at Marseilles, Port Said, Suez, Colombo and Rangoon, and then return to Plymouth and London, so that the South of France, Egypt, Palestine, Ceylon, India and Burma can be visited, and the voyage may be shortened or lengthened at will for any purpose. It is obvious that as the itinerary includes the Irish Sea, the Bay of Biscay, the Mediterranean, the Suez Canal, the Red Sea and Indian Ocean there is a considerable change of temperature and climate encountered by the patient on the voyage.

First, as to those classes of cases that undoubtedly benefit by any sea voyage:—

(1) All post-operation cases, surgical cases generally, and particularly chronic suppuration. Suppuration rarely occurs at sea, and when it does it is of short duration. Except for chronic suppuration cases, a voyage of a few weeks is usually enough, say to Marseilles or Port Said and back by the next ship, a matter

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of about three or four weeks' voyage, according to which port is chosen.

(2) Cases of chronic nephritis and its sequelæ and other kidney conditions that have passed the acute stage do particularly well because a warm, moist sea voyage induces profuse diaphoresis, and so relieves the kidneys. A special diet, of course, must be insisted upon.

(3) Conditions allied to rheumatism, such as gout, lumbago and sciatica (provided draughts are avoided), do very well. The profuse sweating induces copious drinking, so that the tissues are almost in a state of constant irrigation—a condition ideal for the cure and prevention of these diseases. So-called rheumatism in the Far East, except in the hills, is scarcely known, even amongst the coolies who sleep out in the open in all weathers.

(4) Bronchitis and other associated chest conditions are usually very much improved by a long sea journey. The saturated warm salt air acts as a soothing inhalation or "steam tent" for the inflamed mucous membranes. A note of warning must, however, be given here, viz. that chills must be most carefully avoided on the return western voyage; a cold caught on this journey is almost impossible to throw off, and in old people the result may be very serious.

(5) Certain eye conditions, such as opacities in the vitreous humour, are undoubtedly lessened. The strong constant action of the ultra-violet rays on the long voyage tends to induce absorption of floating organic bodies.

Now as to those cases which rarely, if ever, benefit by a sea voyage and, in my experience, certainly not by going East:—

(a) Cases of advanced pulmonary tuberculosis. These should never be sent to sea. The results are disastrous. Hæmoptysis is increased. The conditions on board

ship are quite unsuitable. The cabins are too small, it may be necessary to close the ports during bad weather, and many other obstacles to the open-air treatment of such cases constantly arise. The food, too, is naturally not the most suitable, as it must all come from the refrigerator.

(b) Chronic dyspepsia, gastritis and suspected gastric and duodenal ulcers. These cases should never be sent to sea to be cured. The dietary is again unsuitable, both in preparation and type. By special arrangement a modified diet can be arranged, but it must be understood that the meals are arranged for the healthy, and any alteration of the routine is difficult, and in any case could not be ideal for any length of time.

(c) Diabetics and others requiring a rigid specialized diet. Again special arrangements can be made, but the same difficulties arise and these patients too, should, if possible, avoid a sea voyage.

(d) The mentally deficient and markedly eccentric should not go for voyages if it can possibly be avoided. The insane never, under any circumstances, should be sent to sea with any view to improving their condition. The discipline and confinement of ship life can only be detrimental, the monotony of a sea voyage very often increases any irritability and the opportunities for suicide for those so inclined occur far too frequently. If an insane person should, for any reason, undertake a voyage he should have an attendant constantly with him. Generally speaking, none of this class of case show any improvement and they frequently grow worse.

(e) Those addicted to the abuse of alcohol and drugs. These cases, for the same reasons as above, should not go to sea, but if it is essential for them to travel, a companion should be constantly with them. For those inclined to drink, the opportunity and encouragement to indulge are always present; for those who take drugs,

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the confinement and somewhat monotonous nature of any long sea voyage increases the inducement to resort to their "remedy" against the tediousness of their existence, which is accentuated by their life on board.

Finally, let me urge that there are still further precautions to be taken by a practitioner who is contemplating sending a patient to sea on a voyage to the Far East. First, as to the choice of cabin. If possible a cabin should be chosen on the port side going East, on the starboard returning. If this can be achieved the greatest heat of the sun is avoided, and a cooler cabin at night is the result. The cabin should be about midships and as far away as possible from winches (most important when in a port) and, if an afternoon siesta is indulged in, away from the children's deck. For invalids the whole cabin should be engaged, partly or their own sake and partly for the sake of other possible occupants. Then as to dietary, give strict orders as to what a patient may or may not eat and drink. The general order of food on board is rather too plentiful and richly prepared for an invalid. Careful directions should be given in writing, and if necessary these can be given to the ship's surgeon or chief steward so that special arrangements can be made. Drinking and smoking on board ship are both apt to be excessive, the inducements to indulge in both are very active, and due warning about temperance in all things should be given.

Exercise on board is absolutely essential and yet usually neglected. The games on a ship are not sufficiently active or abundant enough to give exercise to all. Smart walking exercise can, however, be taken by all at all times, but, of course, is best before breakfast and in the cool of the afternoon and evening. An excellent plan, which I believe is sometimes followed, is to form a "physical jerks" class before breakfast,

under a competent instructor. This is a procedure which would be a very valuable additional form of exercise on board ship, and is suitable for universal adoption; it is also a measure that would generally be popular.

It must be remembered, too, when recommending a sea voyage, that between May and September the south-west monsoon blows. The wind then is strong, saturated with moisture, and is very warm and trying. Everything on the decks is damp and dripping, rain-storms are frequent. For choice, a voyage farther than Port Said during these months should be avoided.

Before sailing the general condition of the patient should be attended to, any refraction errors should be corrected, and the teeth should be very particularly examined and any fillings or extractions completed. If any carious tooth is present the voyage will certainly find it out.

I therefore strongly urge that in all cases in which a practitioner is deliberating as to the advisability of a sea voyage a very careful choice should be made, but having made that choice, the improvement will be so marked and so lasting, that the somewhat meticulous attention to detail will amply be compensated for. The results may not be immediately apparent in every case, but the benefit is accumulative and sure, and the patient has not only added largely to his store of bodily health, but has derived an enormous wealth of pleasant memories.

The Value of Sea Voyages in Health and Disease.

(3)

By ARTHUR KING, M.D., B.Hy., M.R.C.S., L.R.C.P., D.P.H.
Surgeon to the Union Castle Line.

AS a generalization, it may be said that in the great life-scheme, everything tends toward the restitution of the normal, yet in the human sphere this fact is often overlooked, and what should be the first resort is often made the last. A patient who is recommended rest and change is apt to assume that the resources of medicine are exhausted. He is impatient and has little faith in the capacity of the body to recover health simply under natural conditions, even though it is a basic principle of life. The practitioner, recognizing this trend of the mind, administers some placebo as a tangible form of suggestion.

It is a thin partition which divides health from disease, and when a person complains that he "does not feel well" textbooks avail little. It is perhaps the initial disharmony in the team work of functions of the body, and will automatically right itself even without interference. But physical examination should never be omitted to establish confidence and as a part of the treatment. In acute maladies the practitioner wars chiefly with the specific causative agents. In the sub-acute and chronic stages his aim is more to strengthen the resistance of the body by normal methods than to engage in a duel with the toxin or microbe. In each case both strategies are invoked, but with different emphasis.

Recovery lagging, the whip cannot be better applied

to stimulate the bodily functions to fuller activity than through the channels of sensuous perception. A change of environment can produce dramatic effects, yet people often smile when a change or sea voyage is ordered; it is the doctor's easiest way of ridding himself of a difficulty. Were this really the one consideration, such counsel would bring medicine into disrepute, for responsibility is great when ordering a patient's life.

No one should be sent on a voyage without a most thoughtful weighing of every factor—their temperament, desires, capability to react pleasantly to strange surroundings, ability to tolerate changes of temperature, their capacity to take ordinary food, their social qualities and tastes, say, for music, dancing, bridge, small talk, reading, etc. Has the sea a charm, or is there an inherent dread of it? There are occasional instances where people, chiefly women, imagine the vessel is about to capsize with every slightest roll. These are incurably bad sailors.

Sea-sickness is usually a passing malady, not infrequently induced by the full-blooded festivals of farewell before embarkation, whereas a mild preparatory cleansing of the alimentary canal would prevent or ameliorate it. It has a large nervous element, probably through the semicircular canals, optic thalamus and pneumogastric. The theories of its production are many, but whatever its cause, the following prescription may be given:—

R Bromide of ammonia	-	-	-	-	grs. ii
Tincture of henbane	-	-	-	-	ʒ iii
Tincture of nux vomica	-	-	-	-	ʒ i
Chloroform water	-	-	-	-	to ʒ i

This mixture, taken every hour or two, with rest in a dark cabin, most often brings relief without distressful after-effects.

Totally unfitted for a sea voyage are those

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cases of delusional insanity, especially when associated with melancholia, for there is every opportunity for self-destruction. The noises and bustle of the ship prevent sleep. The crude inquisitiveness of fellow passengers is distasteful and causes suspicion, while often the patient becomes the subject of complaint entailing disconcerting measures. There is a sense of insecurity engendered among the passengers.

No shipping company will accept a mental case or any form of serious illness likely to end fatally or to require accommodation, food or attendance other than that to which the fare entitles without notice, and then their acceptance is only on special terms. Chronic rheumatism is often favourably affected, attributable to warmth, altered metabolism, salt baths, sunshine and moderate exercise, and this frequently in spite of untreated and unsuspected septic foci. Quiescent tuberculous and bronchial cases are greatly benefited, but with asthma the effect is difficult to predict. The temptation to indiscretion in diet, coupled with the close atmosphere of a cabin, acts detrimentally. Circulatory disorders are not adversely affected. There need be no, or little, climbing; lifts or carrying chairs are available, and the gradient of the companionway is gentle. Renal cases tolerate badly the changes of climate, and the higher temperatures of the tropics, if prolonged over several days, are ill borne. Major surgery, even in experienced hands, is obviously not to be undertaken lightly.

Near the Equator the ship traverses a hot-water belt, part of which later becomes the Gulf Stream, with a temperature of 81° F. to 85° F., equivalent to hot-water pipes in a house. Electric fans move the air and make it refreshing, but the air remains hot.

Having stated on broad lines the type of case which might improve, I shall now sketch the conditions of

ship life, from which a judgment may be made whether this form of change might be advised with a fair prospect of benefit. No guarantees can be given, but if the chief possibilities are studied, less is dependent on chance and a better defence set up in case of failure.

It is by no means infrequent to hear, "Why did the doctor send me on this trip?" and in many instances an answer would be difficult to give. The present-day liner resembles so much a floating city, almost to deception, that the deranged and irritable sometimes show annoyance that the accommodation and conditions are not identical with those of a West End hotel. Perfect solitude and quiet are not possible on board, more especially in stormy weather. Travelling and meals on a train are far less comfortable than aboard in fair weather, yet these disgruntled beings would excuse those discomforts as unavoidable. The unreasonably fastidious should be informed what has to be faced.

Now, life aboard ship has a peculiar psychology of its own, and it is through this changing of mental gear, or pulling out a fresh stop in the human organ, that benefit is derived. Monotony or routine dulls life, and fatigue supervenes sooner than from work of a congenial order. The change of land scene is not so contrasting as a sea voyage and less powerful in effect.

A ship, though a means of transport, is a floating island in a hostile medium with a moving circle of space around. The giant forces of Nature are quite callous and would engulf the ship but for human skill and care. In the old sailing-ship days this consciousness of peril was ever present, but so effectively is this concealed now by the certainty and luxury of travel that it wells up only subconsciously, inducing the herd instinct apart from the necessary propinquity

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in ship life. The idea of self-preservation does not occur, but of type, and energy is centred on the feeling or emotional side of Nature. The sky, the stars, the moon, the movement and phosphorescence of the ocean all tend to foster romance, and life's currents flow deeper and faster, tending to rejuvenescence. Theoretically a voyage should be unsuited to the hysterical subject, but practically the perpetual change of interest acts as a sentinel against introspection. Meals punctuate the day, and the amenities of the table with congenial fellowship, while tempting to excess, drive away life's harming heaviness and so promote digestion, assimilation and nutrition. There is a healthy recklessness induced, the top-censor office is closed in the mind, and the present moment is insulated from the past and future.

Having concluded that a change is indicated, the question of "where" now arises. In the popular mind there is a firmly anchored faith in the sea as being good for all ills of the flesh—ozone, bathing, sun's rays, atmospheric pressure, and temperature being among the nameable factors; so our first thoughts turn to this. A short sea voyage with a health resort as its objective, with fresh features and prospects of fairer and warmer weather, is alluring, and Madeira at once suggests itself, or Teneriffe and Las Palmas for a longer vacation. There is a regular service of liners to Madeira, taking less than four days on the voyage, with a stay of two days in a choice of good-class hotels. The sea but seldom prevents dancing on two nights of the voyage, and the Bay of Biscay, so much undeservedly maligned, takes but twenty-four hours in crossing.

Where the case demands or time allows, the Cape voyage is most delightful. The prospective passenger is offered three courses, two by "intermediate" ships and the other by mail ship. One is the east and west

route, circling Africa, taking the Red Sea and Mediterranean in its itinerary outward or homeward. Its duration is about ten weeks, entailing some hot weather even in the best seasons. But it is crowded with furniture for the mind, making the acquaintance of ports which otherwise would be merely so many names. Malarial fever has, however, been occasionally contracted on this route.

The other "intermediate" route goes to Cape Town, calling at Teneriffe or Las Palmas and sometimes St. Helena and Ascension. The coastal ports visited are Port Elizabeth, East London, Durban, Lorenzo Marques and Beira. There are also excursions to Mauritius. The life on board is similar to that on a mail boat, but more leisurely, more uncertain in time, less intensive and cheaper, suited more to those whose time is unimportant.

The third variety, or mail ship, runs with the punctuality of a railway. The ships are larger and faster than the "intermediate" and represent the aristocracy of the ocean in the Mercantile Marine. The life is much the same as on the smaller ships, but more formal and exacting, commensurate with larger numbers, and the type of passenger consisting more of busy members of the ruling and merchant classes.

In a voyage undertaken for health, elimination of jarring incidents is desirable and a knowledge of detail is useful. On every class of ship there is ample entertainment. The food is of the best and the variety most ample. Profusion of fruit and vegetables, milk, butter, etc., in unstinted supply, provide the necessary vitamins. There is an excellent band at meals, and in the intervals deck tennis, deck golf and quoits during the day and dancing at night give an outlet for physical energy.

The neurasthenic or valetudinarian is swept into the pastimes by the spirit of the ship. The exercise is

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pleasurable, he generates energy as he spends it, and gains confidence in his own capacity. The sun, which he can take or leave, flushes and irrigates his mind and body, and every facet of life is touched.

The voyage to the Cape in a mail ship is nearly 6,000 miles, taking $16\frac{1}{2}$ days, inclusive of a visit to Madeira of four hours. The coasting trip, ending at Durban, occupies five days. The Equator is crossed about ten days out from Southampton, and for a period of five days the temperature is warm, of which two may perhaps be hot. There is very little and sometimes no rough weather encountered, and if any it is on the French and Spanish coast and nearing Cape Town.

Arriving at the Cape the memories of the voyage fade into the background at the vision of Table Mountain and the grandeur of the colouring. Ashore there is the drive round the Peninsula, over 90 miles of probably the most magnificent scenery in the world, and then, to crown all, the Victoria Falls—a fortnight's trip—with which anyone sensitive to beauty cannot fail to be impressed.

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finds among overworked professional and city men. After the first few days on board it is marvellous to note the change which comes over them. They begin by "sitting up and taking notice," and gradually join in games and exercises of which there are no end on board ship. Next to these, in my opinion, come post-operative surgical cases; even with slightly septic complications, for some unknown reason they almost invariably heal up rapidly with ordinary care and treatment.

Convalescents after acute illness, such as influenza, bronchitis, and the exanthemata always improve; but with the last, great care must be taken that the maximum quarantine period is well over, and that the patient and his or her belongings have all been thoroughly disinfected. Indeed, cases of scarlet fever, diphtheria, or whooping-cough convalescents are somewhat risky ones to take on account of their possibility of infecting others or of their being "carriers." Cases of chronic interstitial nephritis generally do well on this particular trip, as it is a warm one inducing perspiration, thereby relieving the kidneys; but they should be under the care of the ship's surgeon. Cases of hay asthma do well at sea and are generally quite free from attacks.

The contra-indications for a hot sea voyage are most important, and may be summed up as follows:—

- (1) Cases showing any tendency to epileptic or maniacal fits.
- (2) Hæmophilics, or those having an apt tendency to hæmorrhage, menorrhagia, epistaxis, etc.
- (3) All active cases of pulmonary tuberculosis.
- (4) Dilatation or weakness of the heart, with or without valvular disease.
- (5) Enlargement of the liver due to dilated right

The Value of Sea Voyages in Health and Disease.

(4)

By W. HAMILTON ALLEN, B.A., M.D.

Surgeon to the Blue Star Line.

IN these days the struggle for existence involving, as it does, so much of hustle, excitement, worry and tension, the cumulative effect on our system is such that it cannot be wondered at that so many suffer from brain fag or nervous or physical exhaustion verging on breakdown and varying only in degree. Those so afflicted may be likened to a highly-strung musical instrument, or some delicate scientific apparatus which require the most careful handling to preserve their tone or balance, or correct and restore the same if unhappily the need should arise, which is too often the case.

I have been invited to write this article in this symposium in *THE PRACTITIONER* especially in relation to the voyages to South America; the round trip is done by passenger steamers from Tilbury in exactly seven weeks, allowing from twelve to nineteen days at one of their ports of call, or ten days at the final one, Buenos Aires.

When a general practitioner or consultant recommends a sea voyage to a patient he should invariably write a letter to the medical officer of the ship in which his patient proposes to travel, giving a brief summary of the case and its treatment to date. This would be most helpful to the ship's surgeon, and obviously beneficial to the patient.

Cases which benefit wonderfully by a sea trip are those suffering from nervous exhaustion such as one

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infectious or contagious diseases cropping up, and the catering is simplified. An equally important fact is that these ships are oil-fuel burning, and the least sophisticated voyager can readily appreciate the advantage over a coal-fired vessel in the absence of noise, dust and grime during the inevitable refuelling, which must be done at least once on the outward and homeward trip, and all ports, when cabin doors and ports have to be closed.

The cabins are large and well furnished, and every bed has a vi-spring mattress. Each cabin has an outside port, a forced air inlet and electric fans, and the ordinary two-berth ones are 18 ft. by 7 ft. Some of the cabins have their own private bathrooms and w.c. The dining saloon, lounge, smoking-room, and veranda café are most artistic and comfortable. The food is excellent and varied; in fact, you can order practically anything you fancy and get it. A notice is printed on the menu cards practically requesting passengers to order any dish they wish. There are no hard-and-fast rules as to meals in cabins as on many lines. No doctor's order is required therefor, and special delicacies and foods can be ordered by the surgeon for any invalid and promptly provided. The decks are roomy and beautifully kept. There is a gymnasium with qualified instructor, a swimming-bath and laundry.

The life of patients on board maybe varied, according to desire or expediency, from extreme sedentary to very active, but they should be advised to avoid any excess of any kind in the way of eating, drinking, late hours, etc. They should practically live on deck, no matter what the weather conditions may be, and a certain amount of exercise should be taken at intervals and gradually increased. For the robust there are all sorts of games throughout the day, whilst in the evening cinema shows, concerts, race meetings, dancing,

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ventricle.

(6) Skin diseases of an eczematous type or ringworm.

(7) Cases of bronchiectasis.

(8) Eye cases with a tendency to glaucoma.

(9) Bad neurasthenia with insomnia, claustrophobia, melancholia, or persons of weak or unsound mind or of eccentric habits.

(10) Unconquerable sea or train sickness.

(11) Arthritis and rheumatic conditions.

(12) Dipsomaniacs.

To those who have never taken a long sea voyage and are ordered a health trip, a few hints may not come amiss. Have all carious teeth thoroughly seen to by your dentist before embarking. Always take smoked glasses for a tropical trip—they will obviate eye-strain and headache and are most restful. With regard to clothing, light flannel is best for the tropics. Bathing suits, tennis shoes, sun hats for going ashore, Asepso soap 3 per cent., and plenty of dusting powder as a preventive to "prickly heat," and, paradoxical though it may seem, ladies should have a good hot-water bottle. Deck chairs are to be had on board, but it is advisable to bring cushions and a rug. Tables are also supplied on board.

When choosing a cabin try to secure one on the port side for outward, and starboard side for the homeward trip. This will mean a cooler cabin at night in the tropics. Motion is least felt amidships, but avoid, if possible, proximity to the engine-rooms and pantries on account of noise.

The passenger steamers which run to South America carry first-class passengers only—175 all told. This is a tremendous advantage, as they have the run of the whole ship; there is practically no risk of

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excellent train, arriving at Tres Barras at 9 a.m. next day. The station, I believe, is Pitangueiras. Here you have nineteen days to spend from arrival at Santos to return journey. In very hot months at Buenos Aires, which are generally January and February, this trip is ideal.

I have given all these details in the hope that they may be interesting and of use to medical men in practice who may have occasion to recommend a sea voyage to some of their patients, and are at a loss as to what particular trip to suggest. Unless one has personally taken trips it is difficult to advise; there are so many points to be taken into consideration as to what line offers the greatest advantages, the intervals between ports of call, etc. This trip being chiefly a tropical one simplifies matters in that there are (after Lisbon) no extremes of cold to be provided for, and intending voyagers can more easily equip themselves; but before deciding on a hot climate, and through the tropics, the idiosyncrasies of the patient should at all times be considered.

bridge and other card games, and a fancy dress ball each trip. The ships carry their own bands, which play during lunch, afternoon tea, dinner, and almost always for dancing after dinner, so that there is no lack of amusement, and everything is done to minister to the enjoyment and pleasure of the passengers.

The usual itinerary is as follows: Leave Tilbury about noon, calling at Boulogne about 6 p.m. to pick up passengers, then on to Lisbon (three days), where passengers can go ashore for four or five hours. The next port is Madeira (two days), where short trips can be taken, then to St. Vincent (three days), where the ship is refuelled in about three hours. Now comes the longest spell of all, to Rio de Janeiro (seven days), where one has about twenty-four hours; on to Santos about eighteen hours, a stay of about twelve hours, where they generally load bananas; a further two days to Montevideo, where there is seldom time to go ashore; and twelve hours later one arrives at Buenos Aires, where the ship remains for ten days, during which time passengers doing the round trip stay at an hotel.

Personally, I advise all who are fit to disembark at Santos and take the trip to the Estancia "Tres Barras," the show fazenda of Brazil, which has been converted into a bungalow hotel with 12,500 acres of land, and where there are unique opportunities of seeing life on a great cattle ranch. Passengers can participate in the rounding-up of thousands of steers, or go riding, fishing or crocodile shooting expeditions. The rooms in this hotel are large and airy, and some bedrooms have their own bathrooms attached. The code of life is simplicity, comfort and health conditions. The altitude is about 2,000 ft. above sea level. To reach the ranch you go from Santos to Sao Paulo, a short and wonderfully interesting journey by rail or car. Then leave Sao Paulo at 9 p.m. by an

excellent train, arriving at Tres Barras at 9 a.m. next day. The station, I believe, is Pitangueiras. Here you have nineteen days to spend from arrival at Santos to return journey. In very hot months at Buenos Aires, which are generally January and February, this trip is ideal.

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The Value of Sea Voyages in Health and Disease.

(5)

By SYER BARRINGTON WHITE, B.A., M.B., B.Ch., M.R.C.S.,
L.R.C.P.

Surgeon to the Royal Mail Steam Packet Company.

ADVISING a patient to take a sea trip for his health is equivalent to advising him to take the waters without specifying the spa or the waters. The varieties of sea trips are legion, but for the purpose of this article they fall under two main headings—namely, mail and cruising. A mail steamer carries three classes of passengers, mail and cargo on a definite run. It is a business trip; that is to say, the majority of passengers are going to or returning from business abroad and are concerned with their work or their prospective vacations. The consequence of this is that, although plenty of sport is provided for the edification of the passengers, this trip is usually a quiet one and therefore ideal from the point of view of people who go to sea for a rest. Going ashore at ports of call is reduced to a minimum.

I am best acquainted with the mail steamers which travel from Southampton and Liverpool to Buenos Aires *via* Spain, Portugal, and ports in Brazil. It is mainly a fair-weather trip all the year round, and plenty of sunshine is a practical certainty. A cruise is different. There are many varieties of these, but there are mainly three—tropical, Mediterranean and northern. A cruise is purely a pleasure trip, with much sport on board and excursions ashore. It is a wonderful change from the humdrum of everyday life, but the trip is much more hilarious than the mail one. There-

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fore, people who must have absolute rest and quiet should choose the mail run in preference. A passenger ought to be in comparatively good health to get the best out of a cruise.

Now comes the question of climate. A ship is an hotel moving at sea level. The atmosphere is naturally humid, but the amount of solid particles is reduced to a minimum in mid-ocean. As to whether a patient will obtain benefit from a sea trip or not depends in a large measure on his adaptability to changes in climate from hot to cold, and vice versa. There are many devices for heating and ventilating a ship, but unfortunately people still exist who seem to prefer living in a stuffy and overheated room, thereby lowering their resistance and adaptability to climatic changes. In rough weather, too, it is unavoidable that the port-holes should be closed, at least on the lower decks. Forced draughts and uptakes minimize the ensuing discomfort.

People unused to very hot weather and who are easily affected by changes of climate may obtain great benefit by making their first trip to Norway, let us say. Here they have a complete change of scenery and a climate which is not as sudden a change from English or Scottish weather as a tropical trip. They learn the various points about life on board under conditions most nearly approaching their home life, and when they wish to go farther afield they will be forearmed against many pitfalls which I will mention presently. During June, July and August last, when the weather in the north was cold, above the Arctic Circle it was quite warm and sunny, and not excessively cold at Spitzbergen.

I have noticed very little illness of any importance on these northern trips, particularly those in which no town of any size is visited. If colds and coughs are prevalent they seem to be connected with visits to

The Value of Sea Voyages in Health and Disease.

(5)

By SYER BARRINGTON WHITE, B.A., M.B., B.Ch., M.R.C.S.,
L.R.C.P.

Surgeon to the Royal Mail Steam Packet Company.

ADVISING a patient to take a sea trip for his health is equivalent to advising him to take the waters without specifying the spa or the waters. The varieties of sea trips are legion, but for the purpose of this article they fall under two main headings—namely, mail and cruising. A mail steamer carries three classes of passengers, mail and cargo on a definite run. It is a business trip; that is to say, the majority of passengers are going to or returning from business abroad and are concerned with their work or their prospective vacations. The consequence of this is that, although plenty of sport is provided for the edification of the passengers, this trip is usually a quiet one and therefore ideal from the point of view of people who go to sea for a rest. Going ashore at ports of call is reduced to a minimum.

I am best acquainted with the mail steamers which travel from Southampton and Liverpool to Buenos Aires *via* Spain, Portugal, and ports in Brazil. It is mainly a fair-weather trip all the year round, and plenty of sunshine is a practical certainty. A cruise is different. There are many varieties of these, but there are mainly three—tropical, Mediterranean and northern. A cruise is purely a pleasure trip, with much sport on board and excursions ashore. It is a wonderful change from the humdrum of everyday life, but the trip is much more hilarious than the mail one. There-

fore, people who must have absolute rest and quiet should choose the mail run in preference. A passenger ought to be in comparatively good health to get the best out of a cruise.

Now comes the question of climate. A ship is an hotel moving at sea level. The atmosphere is naturally humid, but the amount of solid particles is reduced to a minimum in mid-ocean. As to whether a patient will obtain benefit from a sea trip or not depends in a large measure on his adaptability to changes in climate from hot to cold, and vice versa. There are many devices for heating and ventilating a ship, but unfortunately people still exist who seem to prefer living in a stuffy and overheated room, thereby lowering their resistance and adaptability to climatic changes. In rough weather, too, it is unavoidable that the port-holes should be closed, at least on the lower decks. Forced draughts and uptakes minimize the ensuing discomfort.

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towns, for, like fancy dress costumes, they are almost invariably "brought on board" and not "made on board." I have found it easy so far to control the spread of colds among the passengers, but, unfortunately, there will be always a certain number of people who won't keep to themselves or be treated and who broadcast catarrh germs. This sort of thing occurs on shore, of course, but the space available on board is naturally restricted to the size of the ship. One cannot get out and walk, and it is not always easy to escape the "cold-spreaders."

A word as to conditions of life on board ship as distinct from that ashore. A ship contains a floating population of some hundreds of souls, whose radius of activity is confined to the limits of the ship. Nowadays the accommodation, catering, sanitation and water supply are excellent. The accommodation and lavatories are inspected daily to see that they are in good working order. The importance of this cannot be over-estimated. Owing to the ship being a moving body, draughts to a great extent are unavoidable, not only from the motion of the ship, but also from the various devices to secure adequate ventilation and a continuous supply of fresh air. There are a few sounds which are inseparable from a ship, but most people get used to these in a short time.

There are decks which are available for walking and various games, and usually a gymnasium, and there are dances at night. This being so, I wish to describe a few tendencies on the part of passengers to do things which militate against their well-being. In the first place, there is an extensive and attractive menu. Most people, I think, tend to eat too much on board and do not compensate this with adequate exercise; or if they do go in for games, often get overheated from their exertions and stand in a draught to cool down, thereby courting a chill. On hot and tropical trips

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there is a great temptation to drink quantities of iced drinks whilst very hot, or to lie under a fan playing directly on the body. This results in a very unpleasant attack of gastritis or enteritis or both, leading people to believe that they have been poisoned. Starvation and a few doses of mist. alba usually effect a cure in quite a short time. It is strange, but nevertheless true, that in a temperature of 85° Fahr. (moist heat) a draught of air at 75° Fahr. will very often cause a chill if used unwisely for the purposes of cooling off.

Much benefit may be had from breathing clean air and indulging in regular exercise. This promotes a good night's rest. Naturally, there are a few people who might just as well be ashore for all the benefit they get from a sea trip. I refer to those who spend their time, morning, noon and night, in the card-room. Far be it from me to decry a good game of cards, but excess of this, as with everything else, must nullify any advantages of a trip from a health point of view.

A word about sea-sickness is perhaps in order here. In my experience on the North Atlantic and elsewhere, true sea-sickness, as distinct from bilious attacks and indiscretions in diet, is rare. By true sea-sickness I mean a condition of vague hyper-irritability set up by stimulation of the vestibular nerve and possibly through the optic nerves, excluding all toxic cases. The unfortunate subject to this affection usually suffer in a similar manner in trains, buses, and, of course, aeroplanes. An attempt is being made to lower the hypersensibility of the vagus by inhalation of medicated fog; I am trying this apparatus and shall be interested to see what results accrue.

Certain cases should on no account be sent to sea for their health. Active pulmonary tuberculosis does badly in a humid climate, and a sea trip is contra-

indicated. Another type of case that should be taboo is advanced neurasthenia with a tendency towards melancholia. In such a case the sea offers an obvious invitation. Then again, advanced cardiac or nephritic cases should not be sent to the tropics. As regards cases of hypertension other than nephritis, I have not seen any ill effects from a sea voyage so long as the precautions carried out ashore are faithfully observed. The trouble is that a ship seems to tempt people to do things which they would probably think twice about doing ashore.

In conclusion, I will summarize the points mentioned in connection with sea trips :—

(1) Be careful to find out the sort of trip contemplated by the patient and prove its suitability or otherwise.

(2) Find out whether the change of climate will be of benefit or otherwise.

(3) Remember the tendency to overdo things on board ship and the ease of getting chills in tropical climates.

(4) True sea-sickness is comparatively rare and experiments are being made to combat it.

(5) Do not send to sea cases of active pulmonary tuberculosis or advanced neurasthenia bordering on melancholia, and be wary of sending advanced cardiac or kidney cases to the tropics.

The Treatment of Cancer of the Breast.

By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., CH.M.,
F.R.C.S.

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IN this article in THE PRACTITIONER I am not going to attempt to write anything about the symptoms, signs and diagnosis of cancer of the breast, as every practitioner probably knows them as well as I do; nor am I going to write about the importance of early diagnosis, and of the advisability in all cases of doubt—and in the early cases, really early cases, there is more doubt than anything else—of having an exploratory incision made and a piece removed, the surface seared with the cautery to prevent dissemination of cells in case this node proves to be malignant, and an examination made by a pathologist who will decide if further treatment is needed. These are points which in recent years have been more and more accepted. Unfortunately this teaching has sometimes been misunderstood, and I hear from practitioners that they do not approve of what they term “this wholesale lopping-off of breasts”; I am sorry to say, however, that lopping-off of breasts seems to be the interpretation some seem to have placed upon this teaching. I am going first to write here in the very opposite sense—that of the conservation of the early carcinomatous breast. Some practitioners may lift up their hands in horror at such a suggestion, which seems so foreign to all our teaching. Nevertheless, it is logical in certain cases.

We are all ready to admit that carcinoma is a local disease to start with. If this is true, obviously a local

operation should cure it. Our difficulty is to operate while it is still a local disease. The disease starts in the epithelium of the duct and forms a pea-like nodule. The growth must be slow at first, for there are so few cells to multiply; later it becomes a matter of geometrical rather than arithmetical progression. This tiny nodule is drained by the finest capillary radicles of the lymphatics, so fine that cells cannot pass into them and the growth is really local. Later, as growth proceeds and the mass infiltrates the tissues, larger lymphatics may be opened up. Then for the first time comes the risk of cells being detached and passing to the neighbouring glands. These cells seldom lodge by the way, as they are passing into larger and larger lymphatics, and therefore their passage becomes easier till they reach the glands, and there they stay. What happens then is uncertain, the majority may die for all we know. They are delicate cells, and experimentally are not easily preserved in the lower animals even when implanted under favourable conditions. Some, however, manage to live and the glands become infected. As growth proceeds in the gland, the quantity of lymph flowing through it becomes less and less as the gland becomes more and more blocked, the lymph is deflected along other channels to other glands so that other glands become infected, but always from the primary growth and not from gland to gland. Hence it is that if we can remove the primary growth in the early stages no further glands in the axilla will become infected, but those which are infected will declare themselves so infected in the course of time and can easily be cleared out.

Armed with the knowledge—which I believe to be accurate when dealing with early cases, where as yet there is not the slightest sign of malignancy of any sort—that we are removing what we believe to be a simple tumour, we can follow a certain procedure. An

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inconspicuous incision is planned at the edge of the breast, the breast defined and dissected up, and the skin undercut over the area, taking care to keep the knife very near the skin, especially in thin people. A segment of the breast together with the nodule in the centre is removed. It may happen that when there are many nodules and the whole breast is removed locally and then the nodules carefully examined, only one will be found to be carcinomatous. Now what is one to do? One would say that if it is an early cancer a wide operation must be performed at once, and this is usually done—I used to do it myself, and others inform me that they always do it still. But wait: in cancer of the tongue we say that if we keep half to three-quarters of an inch of healthy tissue between the cancer and the knife, that is sufficient. Why should it be sufficient in the tongue and not in the breast? The answer is that in the breast we are not so sure of the edge, but if we keep a reasonable distance away from a nodule it should be the same thing. Remember that we are dealing with a tiny nodule and the possibility of a few cells in the glands, but nothing in between. If the primary growth has been removed there is little likelihood of spread from the glands already infected. As the glands begin to enlarge they can be felt and can be removed by a later operation, but the pectoral muscles need not be sacrificed. One might ask if one could diagnose the nodule as cancer should one do this, and my experience prompts me to answer unhesitatingly "Yes." But in these cases one cannot diagnose the nodule as anything, for it is too small to have developed signs. But I emphasize now that no second operation is needful.

I was led involuntarily to this method of treatment by a nervous patient to whom I had perhaps rashly said that only one operation would be needed. The piece removed contained a nodule of early carcinoma,

operation should cure it. Our difficulty is to operate while it is still a local disease. The disease starts in the epithelium of the duct and forms a pea-like nodule. The growth must be slow at first, for there are so few cells to multiply; later it becomes a matter of geometrical rather than arithmetical progression. This tiny nodule is drained by the finest capillary radicles of the lymphatics, so fine that cells cannot pass into them and the growth is really local. Later, as growth proceeds and the mass infiltrates the tissues, larger lymphatics may be opened up. Then for the first time comes the risk of cells being detached and passing to the neighbouring glands. These cells seldom lodge by the way, as they are passing into larger and larger lymphatics, and therefore their passage becomes easier till they reach the glands, and there they stay. What happens then is uncertain, the majority may die for all we know. They are delicate cells, and experimentally are not easily preserved in the lower animals even when implanted under favourable conditions. Some, however, manage to live and the glands become infected. As growth proceeds in the gland, the quantity of lymph flowing through it becomes less and less as the gland becomes more and more blocked, the lymph is deflected along other channels to other glands so that other glands become infected, but always from the primary growth and not from gland to gland. Hence it is that if we can remove the primary growth in the early stages no further glands in the axilla will become infected, but those which are infected will declare themselves so infected in the course of time and can easily be cleared out.

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and examined. The process cannot be performed by the laboratory boy; the search is a highly skilled one.

Of the ordinary cases I need say little. There are cases in which there is little doubt about the presence of a well-formed tumour, the nature of which can hardly be questioned. A wide operation is performed and a clean sweep made of growth, muscles and glands. This is the radical breast operation as generally understood today. Very good results are obtained with it. But the good results are due entirely to early diagnosis and have little to do with the extent of the operation. It is not acknowledged, but nevertheless it is true, that the pectorals in many cases are removed because of the better access we get to the axilla, and often could be left without any risk whatever.

If there has been delay sufficient to allow wide infection of the lymphatic glands in the axilla the patient will die within three to five years. The reason is obvious: if the lymph cannot flow through the axilla it will flow by one of the many other routes into the chest, abdomen or the opposite side. Laying aside any theories of permeation it is obvious that cancer cells are carried along the lymph stream, and if the stream is going to the chest or abdomen cancer cells are going with it and internal metastases will develop later. It is a usefully false truism to say that no one dies of cancer of the breast. They do not; they die of internal metastases. If the diagnosis be made so late that cells have reached the internal organs, then, plan his operation as the surgeon may, it will not remove the disease. Those cells will kill the patient, and as a rule within three years.

Let me repeat, then, our good results rest solely on our earlier diagnosis and better instruction of the lay public. It is necessary to emphasize this, as many have never recognized its truth.

I shall deal next with the late cases, under which

and I had not the courage to suggest a sweeping operation. I therefore kept her under supervision. That is now over five years ago and nothing has developed. I was very uncomfortable about her at first, but on thinking it over decided that I should repeat the proceeding. I have done it now in over twenty cases and have no cause to regret it. Only in three cases have further operations become necessary to remove glands from the axilla, and no further operations have been needed on the breast. It is interesting to note that in Case No. 31, in the Report of the Medical Society of London on "The Late Results of Operation for Carcinoma of the Breast," only a "local excision with a little breast tissue" was performed; but this patient was alive and well fifteen years later, and the note added runs, "It is not clear why radical operation was not done." Several other cases had local excisions followed later by other operations, with excellent results, and were alive ten to thirty-two years later.

I ought to have learned this lesson years ago when operating on a breast for what was thought to be mastitis. It was removed locally and a piece sent to the pathologist and no carcinoma found. A year later she had some six to nine small recurrences, all carcinomata, near the scar, which cleared up the diagnosis; only then was a radical operation done. That is some twenty years ago, and she still lives.

I might add that the necessary pathological examination required now is very different from what it was. In the large masses we used to examine to find out the exact nature of the carcinoma, the naked eye is sufficient to tell us that it is carcinoma. But the search for early carcinoma is something new. It should be carried out, if possible, by the surgeon or by a reliable pathologist whose methods he knows. The whole breast is cut in thin slices not more than a quarter of an inch thick, and each slice is examined, and any piece which is suspicious is removed and microscoped, so that twelve to twenty small pieces may have to be hardened

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Both X-rays and radium retard healing to some extent, and operations performed after their use are always a source of anxiety. In Paris no operation is permitted for a long period after the application of radium. Even a hot bath has been known to cause a burn after the use of either, and when radium has been used for cancer of the tongue even the use of false teeth is prohibited for fear of irritation.

This limits to some extent the free use of X-rays before operations, though I have used them extensively in one application. Radiologists sometimes say that we surgeons would get better results if our patients were extensively rayed before operation. I doubt this, because considerable delay would be introduced. The hope has been expressed that the dying carcinoma cells might create an antitoxin in the system which might prevent the further growth of the remaining cells, much in the same way as the removal and mincing of the growth and then killing it with X-rays and re-inserting it has been tried. This has had no favourable results in my hands.

The most useful weapon we have is radium. There are several methods of applying radium, and the most efficacious is by using small doses in well-screened needles. Each needle is provided with a small eye and through the eye of each is twisted a piece of fine wire about six inches long. The threaded needles are laid in spirit as an antiseptic. They are inserted round the growth at a distance of about half an inch from each other, and their points should converge if possible under the growth. It has been said that no needles should be placed in the growth itself, but this I always do now if I have a sufficiency of needles. When all the needles are inserted the ends of the wire are twisted together so that none can be lost in the dressings. They are then covered with gauze, and broad strips of strapping fix this in position; a layer of

heading come the large masses in the breast—cases where the skin is tightly bound down or even ulcerated, the mass is at all adherent to the chest wall, or where there are masses in the axilla. To this category must be added those cases which are of rapid growth, infiltrating the breast and increasing its size, perhaps without the formation of a defined growth at all—in fact, acute cancers or what are termed carcinomatous mastitis. The course of these is so rapid that they should be regarded as late in all stages of their development. Here operation is unlikely to prolong life, and we must treat them by other means.

When treating advanced carcinoma the surgeon's best friend is radium. Radium and X-ray therapy are not two separate means of treatment, as some people seem to think, they are very intimately linked together. I am not sufficiently expert on X-rays to be able to say much about them, but the rays given off from radium and those used in deep X-ray therapy are very similar—namely, the gamma and the beta rays. Their differences are chiefly in their concentration, those given off from radium being more concentrated, more penetrating, and therefore more lethal to the embryonic cancer cell. Radium can also be applied much nearer the growth or actually embedded in it. Whether buried radium is better than applied radium I am beginning to doubt, as I have seen such excellent results from the applied forms abroad, especially in the hands of Professor Regaud, of Paris. In this country we get better results from buried radium, but I think that both are equally effective if properly used. Applied radium is good in cases of local external recurrences; these are referred to later.

Both X-rays and radium have certain drawbacks—they both damage the tissues. X-ray burns are now things of the past, but that is not the case with radium burns, and when they occur they heal very unwillingly.

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primary growth is killed; internal metastases are, however, another matter. I have cases alive now three years after this form of treatment in whom the expectation of life was a matter of months. Those cases, too, of acute carcinoma which run such a rapid course can be checked, and whereas inoperable to begin with they can be made quite favourable for operation.

In January 1927, I had a patient from a Government institution sent to me at St. Mary's Hospital. She had an acute carcinoma of the left breast for which operation was obviously of little use, and I wrote an official letter saying that they need not expect her back again. The breast was hard, prominent, fixed, enlarged and full of growth, covered with hard skin resembling pigskin. Two consecutive rings of needles—25 in all (15 two-inch, 10 one-inch), each containing 2 mg. of radium—were inserted and left in for a week. Improvement began at once and she was sent to a convalescent home. In two months the breast was smaller, more mobile and softer. The needles were again inserted. In another two months there was little to choose between the two breasts. She returned to the institution, and I have twice heard from the doctor in charge. The last time he wrote was in January 1928, as follows: "Her condition appears to remain stationary—sometimes I think there has been a slight improvement. Her physical condition has certainly been maintained, and she was at her last weighing thirteen pounds up compared with her body weight four or five months back. She complains of pain at times, but this is not constant." She is still alive, but has developed a condition of cancer *en cuirasse*.

External Metastases.—In those cases of breast carcinoma where recurrences appear in the region of the scar, the cells have escaped from the lymphatics at the time of the operation. They have great difficulty in getting away from the region of the scar, as scar tissue has no lymphatics; but if they are at the edge of the undercut area they can spread as the lymphatics are there present, and they can be seen to be carried along the lymphatics and form little nodules under the skin. Sometimes these nodules are seen in great numbers, sometimes only one or two appear. If they are few they can be dealt with by the insertion of radium needles, which will cause disappearance at once. If they are in large numbers, however, this method cannot be applied. The best method of dealing with

wool is added, and the whole covered with a bandage. The needles are left in for a week at least and are then removed. A small puncture is left surrounded by a tiny area of necrosis which can be dressed with a hot boracic fomentation for twenty-four hours and then covered with lint smeared with boracic ointment. As a rule, shrinkage of the growth is evident when the needles are removed, and this progresses in favourable cases for about three months, at the end of which time it ceases and the procedure can be repeated. This can be done again a third time. Less result can be expected from the second application than from the first, and less again at the third than at the second. It seems that the cells of the growth are more vulnerable the first time, and the normal tissue less so, but that this state of affairs is reversed by repeated application. I have never seen this method stir the growth into renewed activity as I have with other methods.

Another method is to bury larger doses of 45 to 50 mg. of radium in the growth itself and leave it there for twenty-four hours. This has the disadvantage of acting more on the inert and passive parts of the growth, and less upon the periphery, where the cells are more actively dividing. It is a much less certain method and may result in increased growth of the tumour. It has, however, the advantage that the time taken is only twenty-four hours as compared with a week in the other case, and many more people can be treated, which is a decided advantage when the price of radium is so prohibitive and there is so little available.

The results of radium treatment are difficult to state when it is borne in mind that without such treatment these cases are doomed in a very short time. The growth can be checked and made to shrink to insignificance, but what happens then does not so much depend upon the primary growth, but upon the presence or absence of internal metastases. I believe that the

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the current of lymph may not be sufficient, but some cases remain superficial for very long periods. They approach in type the cancer *en cuirasse*, where the infection may remain superficial for years, the deeper organs and even the superficial glands not being affected. The spreading areas may be limited by the insertion of radium needles all round them so as to kill cells carried in advance.

Glands.—The question of infected glands is a difficult one. My experience prompts me to excise them whenever this can be done, and in cases where cells are suspected of having gained the tissue outside the glands a needle of radium can be left in the wound for twelve hours, and is then removed by drawing upon the wire which protrudes from between the stitches. The radium may cause a considerable flow of lymph for a day or two, and if left in too long will delay the wound healing. I had several distressing cases when groping my way with radium. Some healed soundly at the time and then gangrene appeared later in the skin over or near the scar, evidently burned from within. It is only when used in the immediate neighbourhood of the wound that radium has a bad effect.

When glands above the axilla are infected there can be little hope of a good result, and it is best to treat the patient by the insertion of radium, at the same time radiating the chest with X-rays, as it is almost certain that internal metastases are present.

Internal Metastases.—These so far are beyond the range of operation and, as yet, of radium. They can, however, be treated by X-rays, not always successfully, as we cannot tell the range and disposition of any but the largest masses. It is impossible to radiate the person sufficiently to kill all carcinoma cells, and any attempt to do so would kill the patient; if we wait for the metastasis to declare itself other small ones will form,

them is to take a tube of radium, about 45 to 50 mg., wrap it in gauze and fix it to a strip of plaster. The plaster is then fixed to the chest wall with the radium over the nodule. Another method is to warm the tube, embed it in paraffin, and fix the block of paraffin to the surface by strapping. Six hours may be insufficient, sometimes twelve are needed—I have left them on even for twenty-four—but as a result of this a superficial burn may appear, and the epidermis may come off. Longer periods will cause a deeper burn, which is very difficult to heal. The nodules treated by this method disappear as if by magic. In a week's time a person can be freed from a great number. Others will appear, of course, as those which are microscopic cannot be treated until they are located. Perseverance is needed in these cases. Here again the ultimate results will depend upon the presence or absence of internal metastases.

Two and a-half years ago I operated and removed the breast of a lady who had noticed a lump in it for over a year, but through fear had done nothing. She did not see me or her own practitioner again for eighteen months, when she reappeared looking very guilty, and an area of about eight inches below the scar was covered with small nodules in the superficial fascia. Twenty-five needles of 2 mg. each of radium were inserted under and around the nodules. Many nodules disappeared. Later she had three exposures of X-rays spread over three months. By the time I saw her again the number of secondary nodules had again increased and spread much further down towards the groin. Twenty-five needles of 2 mg. each of radium were again inserted round the area and under the nodules and left in for a week. At the same time, a tube containing 50 mg. of radium, fastened to a small square of paraffin, was placed over different nodules and left in place for eight to ten hours. The needles were left in for a week. I saw her again one month later, and there was not a nodule visible or to be felt anywhere. I do not expect her to remain free from nodules, they are bound to reappear, but the mental effect on that patient of finding herself apparently free from the dreaded disease is enormous.

In many of these cases of superficial fascia infection the cells are not carried to the viscera—why it is difficult to say; it may be that the lymphatics are so small that free passage for the cells is not gained, or

Actinotherapy in Nervous Affections of the Skin.

By W. J. O'DONOVAN, M.D.

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ULTRA-VIOLET therapy has passed out of the hands of the early experimenters into general use throughout the profession. This inevitable advance is mirrored in hospital practice, since oculists, children's specialists and surgeons demand installations for their special use and the skin physicians who pioneered these installations in general hospitals are no longer called upon to watch closely the special work of their colleagues, and are able to further the application of ultra-violet therapy to their own special interests. The literature of the future will then necessarily contain many papers, not from ultra-violet technicians, but workers in special departments of medicine who are testing out ultra-violet treatment in their own spheres.

ECZEMA.

One of the striking characteristics of the literature of light treatment has been the extensive recommendations that have been made for its use in the treatment of eczema, which is in startling contrast to the scanty references to eczema in dermatological standard textbooks. The explanation of this must be sought in the fact that men who have taken up light therapy may be up-to-date in this branch of physics and in one or two branches of medicine, but their dermatological nomenclature may have crystallized when they left their medical schools before the war. For instance, Erasmus

and we cannot catch up and kill them all. Time may reveal something to help us in this matter, but at present X-rays are at a great disadvantage. I have been strongly tempted lately by successes in superficial masses to open up an abdomen, insert radium boldly into a secondary mass in the liver, and watch the result.

X-rays have one marked beneficial result, and that is in the relief of pain caused by deep growths, especially those in the bones and region of the spine. How much good is achieved by radiating patients after operations indiscriminately to prevent recurrences it is difficult to say; and I must confess that although I recommend most patients to undergo a course of X-rays, I am very sceptical as to the benefits they derive from so doing. I cannot see any great gain, and it is extremely rare among the large numbers of cases which pass through one's hands to see any patient's life greatly prolonged if she has got well-marked recurrences when sent for X-rays.

Lead Treatment.—I always use the method introduced by Professor Blair Bell of treating carcinoma by means of lead. For three and a-half years all cases in hospital have had a course of lead, whether operated upon or not. I have had some surprisingly good results, but none which I can call cures. I started with the lead iodide colloid, and have tried many of the stronger, more toxic and, therefore, more dangerous forms in which lead has been given, and have returned again to the iodide as being the simplest. Any good results I have obtained were, with one exception, obtained from it.

I believe that lead is especially good in connection with radium. The cancer cells take up lead and should, therefore, become more resistant to the rays. The rays act in a more lethal manner upon the cells, and we get the effect of the radium localized and intensified. At least, that is the conclusion which appears to me to be logical. Time alone will show if it prove true.

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effect that eczema is a common condition and ultra-violet radiation is a very valuable therapeutic agent, calls for considerable elucidation.

If we agree that there is a condition which can be termed "eczema" it is not right to say that there is one very valuable treatment if we admit that its etiology is multiple. For comparison, pleurisy may be due to local injury, to pneumonia, to the tubercle bacillus, to pyæmia or to œsophageal neoplasm, hence there is no one treatment of pleurisy, and the same line of reasoning applies when we consider the ultra-violet light treatment of eczema.

SYMMETRICAL STOCKING ERYTHEMA.

A special type of eruption I would put before you for consideration may be described as "stocking erythema." This is a red, eczematous condition of the legs that extends from the knees down to the upper level of where the shoes reach. The condition may have gone on for ten to fifteen or even forty years. The accompanying symptoms of irritation or pain in the leg are spoken of with superlative adjectives by the patient, and I would say, almost invariably, the patient will put down the causation to a very definite accident described sometimes with precision in the following terms: "It is due, sir, to the fall of a packing-case at 3 p.m. that weighed three hundredweight, it fell from a height of three feet, grazed my ankle, and knocked me silly. I went to a doctor, who treated it with ointment, and my leg has been bad continuously since." These patients are intensely interested in their legs; they treat them with the greatest consideration, and the valuelessness of local medicamentation is shown by their long medical history. Occlusive treatment at present offers the greatest chance of speedy recovery. These symmetrical, red, dry, or oozing legs are found in abundance at most skin clinics. Light

Wilson, who financed the bringing of Cleopatra's Needle from Egypt to the Thames Embankment, gives twenty-two headings to the discussion of eczema eruptions in his textbook, "Diseases of the Skin," 1813 (fifth edition). This covered thirty-two pages. My distinguished late colleague, Dr. J. H. Sequeira, in his textbook, "Diseases of the Skin" (fourth edition), forty-four years later, uses the term eczema for a "limited group of cases" in which there is no evident external irritation, and he applies the word "dermatitis" to conditions caused by external irritation. He goes on to say that "my own experience supports that of other observers that outbreaks of eczema may follow prolonged nervous strain, and also that worry or anxiety may aggravate a chronic condition. As an example I may quote the case of a journalist patient of my own in whom there were weekly exacerbations which were found to coincide with overstrain connected with the weekly issue of an important newspaper. These entirely disappeared when he was relieved from his recurrent pressure. There is also a type of patient whose self-control is weakened and who scratches violently on very slight provocation, easily producing an eczematous eruption. It is difficult often to determine whether we are dealing with neurosis or with some mild toxic condition, inducing hypersensibility."

Sir Norman Walker, in the eighth edition of his "Introduction to Dermatology," is even bolder: "Eczema is a term which has long been, and is still, too commonly applied to any wet or scaly inflammation of the skin, of the cause or nature of which the observer is ignorant." He entirely agrees with the late Dr. Neville Hyde, who wrote: "Is it not clear that the word 'eczema' has outworn its usefulness?" In the light of this, the statement found not in one, but in several well-known textbooks on light therapy to the

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fidence when varicose veins are in fact quite small. None of the ordinary developments of microbic infection occur in these cases, such as lymphangitis, adenitis, cellulitis, pyrexia or amyloid disease. These patients find a great outlet for self-expression in their disease; it is fair to say that its presence relieves them from many duties and responsibilities and adds an interest in life.

Such mutilation as makes a medical student think at once of amputation for immediate relief is viewed with complacency by the sufferer. It is strange that so unsurgical a procedure as complete occlusion of the ulcer with no provision for drainage is followed, not by an aggravation of the disease, but by an immediate improvement. The approved modern treatment is strapping, so arranged that it covers the ulcer and the tissues above and below. A piece of sterile gauze is first laid over the lesion itself. The strapping is commonly changed weekly. This treatment fails if a window is left for dressing the ulcer.

Varicose ulcer may be looked upon as a chronic *dermatitis traumatica*, which for treatment needs two co-operating agencies: (1) A powerful tonic acting upon the patient's psyche; (2) a mechanical interposition protecting the ulcer from a fixed habit of rubbing or scratching, asleep and awake, together with the prevention of uncleanly home treatment of the open wound.

The use of ultra-violet light for the general stimulation of the patient, the heightening of self-control, and the instillation of a new and powerful suggestion of cure is of great value. From what I have said about the dressing of the ulcer it follows that local treatment of varicose ulcer by ultra-violet light is unlikely to prove of value, and, in fact, owing to non-success I have given up its use for this purpose in my own clinic. The successfully planned treatment of varicose ulcers

therapy is of service in these cases, but only from its general stimulating effects on the patient's psyche. The lesions should remain covered during treatment. Actinotherapy applied to the lesions can certainly temporarily lessen the irritation, but is misdirected from a want of recognition of the essential nervous etiology of this state.

VARICOSE ULCER.

The publication of statistics of cures of "varicose" ulcers by one or other special method of treatment is an unconvincing method of advocacy unless there be a rigid equality of cases and an accuracy of continued records that is almost impossible work amidst a hospital population. It seems to me unsound to discuss the treatment of varicose ulcer unless those who take part in the discussion are fundamentally agreed as to the pathogenesis of this state. That the problem is not simple is sufficiently indicated by the nomenclature in Sequeira's textbook, "Diseases of the Skin" (fourth edition, p. 440)—"The So-called Varicose Ulcer."

There are anomalies about this condition that are at present unexplained. This disease is a monopoly of the poor or poorly educated. It is often treated for years with complete neglect, or by occasional quack medication. Patients appear at dermatological clinics with varicose ulcers five inches across and three-eighths of an inch in depth that have existed for twenty years, and for which they have previously sought no professional advice. In spite of this they will describe their symptoms with dramatic words that suggest an intensity of pain while their features remain remarkably placid. These ulcers are never situated over the site where the varices are largest. They are never found in the thigh, where varicose veins are nevertheless quite common; they are unknown over abdominal varices. Varicose ulcers are frequently diagnosed with con-

lamentable state has been arrived at, it will be found that the process of evolution is fairly constant. These sufferers are very fond of presenting anyone whom they may consult with a full record of their medical history and experiences. It is characteristic of the chronic skin (or "chronic abdomen") that almost any new treatment, and especially an operation, produces benefit for the time. Such a patient is thoroughly investigated, if she can afford it, at a "team-work" clinic. She has been provided with an X-ray picture-book of her entire alimentary canal; the teeth have been extracted and her tonsils excised; her secretions have been analysed by a biochemist and her mind by a psycho-analyst; she has had several rest cures; she has been given prolonged courses of vaccines, of intramuscular tonic injections, of intestinal antiseptics and of endocrines; she has been fed on sour milk or minced beef or raw vegetables; she has experienced various forms of massage, has been subjected to the latest kinds of electrical current, and has had her colon repeatedly washed out at Plombières or Harrogate. In a word, she has run the whole gamut of "modern" therapy, has submitted to every "stunt" and conformed to every fad—but is none the better. The rôle of light therapy in this condition must be for its general effect upon the patient, and not essentially through local therapy to the flushed capillaries.

ALOPECIA AREATA.

The last cutaneous condition to which I would draw attention is alopecia areata. Few references to a nervous factor in this condition can be found in major textbooks on skin diseases; hence it is not odd to find that the value of local light therapy is heavily stressed. "Alopecia areata especially gives remarkably successful results with radiation, which is considered the treatment *par excellence* for this condition." But

must be based upon some definite conception of their etiology; and, viewing these ulcers in the way I have indicated, the help that ultra-violet therapy certainly affords is based on the known benefits of this treatment in other conditions where the tone of the higher nervous system is lowered. Ultra-violet light meets the needs of the etiological aspect of the condition that I have attempted to demonstrate in a way that no other therapeutic agent is so exquisitely designed to fulfil.

ACNE ROSACEA.

Cures are reported from the treatment of acne rosacea by ultra-violet radiation. Cures have been reported of this condition from almost all forms of therapy, and yet these cases are recognized by dermatologists as being most intractable. The underlying mental and vasomotor condition of the patient has to be considered at every stage. Dr. A. M. H. Gray says that the mechanism of this vascular dilation is not quite clear. It is generally assumed that some toxic substance is absorbed and acts on the vasomotor system, "but it is more probably a neurosis." It is much more common in women than in men—in a proportion of six to one. In the early stages of this disease, and before pustulation has become a feature, it is noteworthy that for periods at a time the physical signs are completely absent, and when well established they vary in intensity, becoming great during mental disturbances or during the period of climacteric. I have twice met with patients who attributed this trouble to domestic unhappiness: in one case to alcohol and in another to infidelity, and both were educated women able to give a clear account of themselves. Patients with acne rosacea, if questioned, explain their symptomology as indescribable sensations, a poisoned feeling, and neurotic pains all over. If one inquires of a patient with a fully-developed acne rosacea how her

Recent Researches into the Problem of Dental Infection.

By F. N. DOUBLEDAY, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeon to Guy's Hospital.

IT may be well to begin this article on dental infection in *THE PRACTITIONER* by stating the means of diagnosis available when a practitioner is asked to give an opinion as to whether a case of general infection may originate from a dental source. His clinical experience will help him to judge whether the lesions from which the patient is suffering are commonly associated with lesions seen in the mouth. He will begin by a careful clinical examination of the mouth and proceed by means of skiagrams to discover the extent of pathological change around the teeth and perhaps to discover some hidden infection which was not apparent upon clinical examination. If the two means of diagnosis already employed indicate dental infection he will ask a dental surgeon to remove, under aseptic precautions, one or more of the most actively infected teeth or bone areas, and by cultures from these he can discover what organisms are growing there and what are the reactions given by the patient's serum to these organisms. He may also obtain a differential blood count, noting the presence of lymphocytosis, as especially indicative of some chronic infection not necessarily dental in origin. Then there is the further question as to whether or not the salts of the blood, and especially the blood calcium, will give reliable information as

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alopecia areata is essentially a reaction to nervous overstrain. I have published in "Dermatological Neuroses" a long series of cases of alopecia areata showing marked signs of nervous instability such as tremor, drooping wrists, insensitive palate, and sclerotics and electric knee-jerks, together with definite histories of psychic shock. The following three cases are fairly typical:—

Case 1.—G. R., aged 27, has had headaches for two years and had a nervous breakdown twelve months ago. Her husband, who lives with her, has had frequent fits since the war, and she is up every night attending to him. She is shaky, depressed and weak. Her hair has been falling, she says, for twelve months, and she shows a large solitary area of alopecia areata.

Case 2.—A. A., aged 26, shows a patch of alopecia areata three inches in diameter, covered with a fine growth of downy white hair. She has been unable to work for two months owing to her "nerves." She works at a rope factory and "notices crawling germs in the rope she works with." She also states that the leather belting of the machinery catches on fire and this frightens her. She jumps in bed, cries frequently, is very garrulous, and frequently laughed during the consultation.

Case 3.—E. M., aged 38, has an area of alopecia two inches in diameter which is of six weeks' standing. Her husband has been out of work for two years; she has had two still-births, the last two years ago; her Wassermann reaction is negative. She complains of depression, which has lasted for several months, together with sinking feelings, palpitations and excitement; her knee-jerks are glib, her extended hands tremulous, and her sclerotics and palate are insensitive to touch, whilst the skin of her forearm can be transfixed with a pin without causing her discomfort.

That some of these neurogenic cases, therefore, will benefit by a new local treatment that is in public repute is only to be expected; but, apart from those who are cured by this suggestion therapy, there will remain a large body of patients suffering from relapsing alopecia areata who will need ultra-violet therapy to the whole body for its tonic effects rather than as a substitute for a rubefacient liniment to a bald but otherwise healthy area of scalp.

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to the patient's general condition.

STUDIES IN BLOOD CHEMISTRY AND ACTIVATORS.

The present writer visited America first in 1926 as a delegate to the International Dental Congress, held in Philadelphia in that year, and afterwards visited some of the principal teaching centres in the United States and Canada. The things then seen made so great an impression that a second visit was paid to certain selected localities in the autumn of 1928.

The most interesting advances are being made in the field of bio-chemistry and, above all others, by Dr. Weston Price¹ of Cleveland, Ohio. He began with full blood studies which led him to consider that the proportion of salts in the blood is one great factor. He has shown,² by animal experiment, that an infected root apex, aseptically implanted beneath the skin of a rabbit, will send its blood calcium much below normal, and that illness, and frequently the death of the animal, will follow. Often the lesions in the rabbit will resemble those which occurred in the patient from whom the infected tooth was removed, thus corroborating to some extent the work of Rosenow upon elective localization, to which further reference will be made. In the human subject the normal amount of blood calcium is about 10 milligrammes per 100 c.cm., and various workers have reported that they do not find a big variation in this content. In severe illness the serum calcium may be depressed to 7 milligrammes or occasionally even less, but the usual variant is more nearly 1 to 1.5 milligramme. Price, however, contends that it is not merely the diffusible (serum) calcium which must be studied but also the fixed calcium in the cells. Probably this is a measure of the fixed calcium in the tissues all over the body. When the body is seriously invaded by infective disease the fixed calcium salts of the body are mobilized

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to assist the blood and other tissue cells in their fight against disease. One of the problems of modern medicine is so to build up the patient's tissues that they will be able to resist chronic infections.

Seeking further information upon this subject in the Bio-Chemical Department of the Mayo Clinic, a most interesting conversation with Dr. Kendall resulted. The following account must be taken as my own impression of what was said and not necessarily as a correct interpretation of Dr. Kendall's view. Apparently in the Mayo Clinic no great importance is attached to the chemical changes in the blood in cases of dental infection. The view held is that the fluid part of the blood is so constant that no wide variation is to be expected there, except in cases of very severe calcium deficiency. If the body is deficient in lime salts it is more likely to draw upon the fixed lime salts in the tissues and deplete its calcium reserves rather than to allow the body fluids and cells to go short of lime salt. This agrees closely with the views which had been expressed in the Pathological Department at Guy's Hospital when the writer was preparing his mind for the things which he hoped to see in America. It does not essentially differ from the views of Weston Price; but Price is looking to blood chemistry to give an earlier indication of calcium deficiency and is apparently finding it in the fixed lime content of the cells rather than in diffusible lime salt of the blood serum. Further examination of this fixed calcium in the blood cells seems desirable to confirm or reject the value of this technique in diagnosis.

Weston Price considers that in order to raise the calcium reserves in the body of a patient whose calcium content has sunk too low, it is not only necessary to administer calcium but also to give some activating substance which will enable the calcium to be utilized. One of the earlier means of doing this was by the

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administration of parathyroid extract. The work of Vines³ upon this subject will be recalled. It has, however, been shown⁴ that parathyroid mobilizes all the fixed lime salt in the body and in this way depletes the calcium reserves, and hence is not a desirable means to employ unless sometimes where the body contains large quantities of pathologically combined calcium. Price endeavours to activate the cells to utilize lime salt by administering activated cod-liver oil or by carefully graduated doses of ultra-violet light.

Dr. Weston Price has taken great care in the study of the activators which may be employed to increase the assimilation of salts by the body. He has visited the cod-liver oil factories and studied the process of manufacture. He has also devised a special spectroscopic camera which he mounts in a car and sends round Cleveland obtaining photographic records to enable him to determine the wave lengths of natural sunlight in various parts of the city. He has also devised apparatus and done a great deal of experimental work on the effect of artificial light rays upon animals. Dr. Weston Price⁵ states that he can increase the utilization of calcium lactate in chicks either by administering activated cod-liver oil by the mouth or by rubbing it into the skin of the neck. In these experiments the average total calcium of the control chicks was 9.9, of which the active calcium was 8.1, and the inorganic phosphorus was 4.5. Chicks receiving 5 per cent. cod-liver oil activated in the sun for fifteen minutes had a total calcium of 13.1. The average inorganic blood phosphorus for control chicks was 4.5, whereas the group receiving 5 per cent. cod-liver oil had an average of 5.2. Price considers that the oil is best activated by placing it in an open dinner plate and exposing it to the bright noonday sun for three to five minutes in summer or from five to fifteen minutes in winter. Ten minims of the activated

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oil and from one to ten grains of calcium lactate are administered three times daily. Price considers that rays from a mercury vapour lamp produce harmful changes in the oil. He also believes that the dose of the activator must be kept within moderate limits. One most interesting observation was the lime content of collections of cystic fluid in the necks of chicks into which cod-liver oil had been rubbed. This fluid was found to have a higher lime content than the concentration of lime in the blood from which the additional calcium must have been obtained. Since the normal level of the calcium tissue fluid is approximately one-half that of the total calcium of the plasma, this is held as evidence that the cod-liver oil has increased the local concentration of the lime salt at the point where it was rubbed in. There are two *prima facie* things to be said for Weston Price :—

(1) The fact that the blood is the tissue likely first to show evidence of dental infection. Dr. William Hunter called attention to this in his original address on oral sepsis at Montreal in 1907.

(2) In a general disease which is secondary to a dental or other focal infection, one of the first tissues to show evidence of change will be the blood. The secondary anæmia which is often seen in a patient suffering from prolonged dental infection is a familiar clinical example of this. When the blood picture is examined more fully the following factors may emerge : In a differential blood count the polymorphonuclear leucocytes will be diminished and at the same time there will be an increase in the number of mononuclear lymphocyte cells and the hæmoglobin may be considerably diminished.

CHRONIC ARTHRITIS.

Dr. Weston Price has made a wide study of cases of chronic arthritis which were believed to be secondary

to focal infection. He divides these cases into three groups:—

(1) The first group comprises those showing rarefying osteitis with extensive decalcification. He considers that in this group translucent areas around the apices of infected pulpless teeth typify a good reaction to an irritant. This is because Dr. Price considers that a root granuloma is a protective mechanism, actually inhibiting, by its leucocytes and antibodies, the growth of organisms, and showing that the patient has a good power of resisting bacterial infection. Hence he considers that these patients have a normal or high ionic blood calcium and a high bactericidal reaction against streptococci as well as most other organisms. They do not, therefore, develop diseases of the rheumatic degenerative type, but in Price's opinion they are found later to develop tuberculosis, especially of the miliary type, and cancer. His records suggest that tuberculous and cancer patients rarely suffer from proliferative arthritis. These patients show little or no dental caries.

(2) In the second general group, the radiographic picture shows a condensing osteitis around an extensive rarefying osteitis. These are patients who formerly had a high defence but have lost it as a result of infection and physical overloads. They are therefore to be looked upon as having an acquired susceptibility. Their blood calcium is below normal, and so is the bactericidal property of their blood. Inquiry into their history will show that formerly they had little dental caries, now that they have passed into the second group caries will occur. They also show a tendency to break down in their nervous system. The patients in this group do not develop the proliferative type of arthritis, but they do develop the degenerative form. These degenerative cases tend to a normal or high ionic calcium in the blood: they are susceptible

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to sensitizations such as skin lesions, asthma, hypertrophic rhinitis, etc. The prognosis in their case is good and under proper treatment they should show marked power of recovery.

(3) In the third group there is generally a family history indicating inherited susceptibility. Skiagrams show, both in cases where the changes are at the gingival margin and in those in which they are apical, condensing osteitis or a slight rarefying osteitis. The ionic blood calcium is low, as is also the bactericidal efficiency of the blood. The lesions from which they suffer are frequently of the streptococcal and rheumatic type of disease showing lesions in the heart, kidney or digestive tract, proliferative arthritis, etc. They seldom develop cancer or tuberculosis, but if they do develop tuberculous glands or foci, these tend to calcify. This should be compared with an article by Stone⁶ on the classification of arthritis.

ELECTIVE AFFINITY.

Readers will be familiar with the experiments of Dr. Rosenow⁷ of the Pathological Department of the Mayo Clinic showing that a strain of organisms originating in such a focus as a tooth, and tending to cause, e.g. endocarditis, in a patient will frequently produce the same type of lesion when inoculated into an animal. The most interesting feature of a visit to the Mayo Clinic was to be found in the Pathological Department. Its work is carried on in a farm about three miles out of the city. In this ideal locality is a quarantine station for animals, a farm for reserve stock, and well-equipped kennels and separate operating and post-mortem rooms are incorporated in the building. The animals employed appear to be chiefly monkeys, dogs, rabbits, guinea pigs, rats and frogs. Two whole-time veterinary surgeons are employed to care for them. Dr. Rosenow and his assistants are comfortably housed

in laboratories which are well equipped with modern bacteriological and physiological apparatus. Dr. Cook⁸ is a whole-time dental assistant employed in this department, and his researches are of great value. He has not only succeeded in producing typical bone rarefaction areas around the apices of the intentionally infected teeth of dogs, but has also produced secondary changes from them. For instance, the tooth pulp of a dog was removed under all the precautions taken by the most careful dental surgeons, and then the root was inoculated with organisms which had caused ulcerative colitis in a human patient, and then both the root canal and the tooth were carefully filled. These dogs developed at first a local jaw lesion and later a typical ulcerative colitis.

At some American centres, as is the case in other countries, there is a tendency to try to convince one by argument rather than by experimental proof. In the Mayo Clinic Pathological Department experimental proof of every step is offered. The microphotographs of the original cultures, the dog's skull with skiagrams of different phases of the case during his life history, photographs of the colon and of the organisms recovered from it, and the colon itself with its ulcerated and hæmorrhagic surface are preserved for examination. This is proof in the Hunterian manner of actual observation, and Dr. Rosenow and Dr. Cook are to be congratulated, both upon the thoroughness of their methods and of the courtesy with which they show it. It will be remembered that Professor Wilkie, of Edinburgh, has shown similar experimental proof.

Dr. Cook attends the afternoon operations at the clinic, and collects the material which he afterwards investigates. Standard bacteriological sets are made up for use in the dental operating theatres. When cultures are to be taken the gum surface is first cleaned over with alcohol and then with iodine, after which a

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swab is smeared over the gum margin and plunged into an agar tube. If anything grows on this all the subsequent cultures are discarded on the ground that contamination has occurred. Subsequent cultures are taken in the customary manner and grown on blood agar and on glucose broth in deep culture tubes containing calves' brain in the depth of the broth and covered by a layer of vaseline above, so that both aerobic and anaerobic cultures are obtained. These tubes are coloured with fuchsin, which turns pink if acid-producing organisms develop in them. The apices of infected teeth are cut off with sterile cutting forceps and dropped into phials containing sand and gelatin lockc. They are put into a mechanical shaker so that the material from the root apex is thoroughly broken up, and then they are washed out into glucose broth and cultured.

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A Case of Lichen Planus Ruber.

By JOHN BURGESS, F.R.C.S.I.

Late Examiner to the Royal College of Surgeons of Ireland, etc.

MY objects in bringing this case under the notice of the readers of *THE PRACTITIONER* are the following:—

- (1) The intensity of the itching, which made sleep impossible, except in short snatches, for five weeks.
- (2) The resistance to all the ordinary remedies, external and internal, the former merely giving a few minutes' respite from the irritation, which was of such an aggravated character that I feared for weeks that my patient would lose his reason, while otherwise he was in robust health.
- (3) The rarity, at least in my experience, of this form of skin disease.

A busy professional man, aged 65, consulted me for an irritation between the gluteal folds, accompanied with itching of front of the forearm and thighs. There was an eczematous condition between the nates similar to what used to be called intertrigo, and I could detect nothing on either forearm or the thighs. The patient was stout, very excitable, and with a gouty family history. His work was of the usual office type, but he managed to get a certain amount of exercise at golf, keeping well within a limit, as any sudden strain produced anginal symptoms, for instance, playing against a strong wind, etc. His urine did not contain either sugar or albumen, and except for an occasional asystole, which he was conscious of, there was nothing abnormal about him.

On my next seeing him, his chest and abdomen, arms and legs, were covered anteriorly and posteriorly by a purple papular rash, with a tendency to form plaques. Those on the anterior surface were the size of a florin, and somewhat smaller on the back. They were discrete papulæ, but as I have stated, the tendency was to the group formation. The rash was dry except under the prepuce and between the nates, and showed especially over the front of the thorax. Wickam's striation, the lilac colour referred to by several writers, was here confined to the anterior surface of thighs. The itching was

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most intense at the upper portion of the trunk, and at the scrotum. There was œdema of the left foot extending to below the knee: this I could not account for, unless the presence of some varicose veins in the leg was sufficient to cause it. During the day, due, I presume, to business occupation, there was a mitigation, but when he went to bed the itching was so maddening that he had to get up, light his fire, and remain sitting in a chair until morning, when, exhausted, he generally got an hour's sleep. To his constant inquiries, "Am I going to be long like this? If so, I shall throw myself out of the window," I could only reply that the acute stage would not persist for any considerable time, but I could give no definite limit.

Several times I tried to persuade him to consult someone else, but without any avail. I certainly dreaded my morning visit, but, realizing what he was suffering, I allowed him to pour the vials of his wrath on me without complaint, telling him I was doing all in my power. At the end of five weeks he was invited to spend Christmas with his sisters some distance in the country. He objected, as he could not have either a fire in his bedroom or a bath. Taking into consideration what effect his surroundings must have on his condition, that every object in his room reminded him of the agony of the previous night, I forced him to accept the invitation, relying that a total change would have a sedative effect on his nervous system.

On his return the itching of the scrotum still persisted, but the rash on the trunk had lost its raised appearance and purple colour. From this he gradually improved and when last seen, a week ago, the irritation had entirely ceased. It would take too much space to give in detail the treatment. What gave the best results were soda bicarbonate baths, with the following lotion which was prescribed by Dr. Walter Smith for a patient I sent to him years ago:—

R.	Calamini	-	-	-	gr. xv.
	Glycerini boracis.	-	-	-	} aa ʒij.
	Spt. menthol. pip.	-	-	-	
	Liq. carbonis detergens	-	-	-	ʒ xv.
	Spt. chloroformi	-	-	-	ad ʒj.

Internally, first of all an intramuscular injection of salvarsan was given, followed by a mixture of potass. citrat., liq. arsenicalis and liq. hyd. perchlor. I refrained from giving pilocarpine, thinking that by driving the blood to the surface it would increase the itching, but at the patient's suggestion that he would like his skin less dry, I gave sodæ salicyl. grs. xx at bedtime. Whether the disease was declining at the time I know not, but he expressed himself as better after the nightly dose of this drug. He lost 28 lbs. in the five weeks, due, I believe, to his diet, from which all meat, fish, sugar, butter and vegetables were excluded.

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(3) The rarity, at least in my experience, of this form of skin disease.

A busy professional man, aged 65, consulted me for an irritation between the gluteal folds, accompanied with itching of front of the forearm and thighs. There was an eczematous condition between the nates similar to what used to be called intertrigo, and I could detect nothing on either forearm or the thighs. The patient was stout, very excitable, and with a gouty family history. His work was of the usual office type, but he managed to get a certain amount of exercise at golf, keeping well within a limit, as any sudden strain produced anginal symptoms, for instance, playing against a strong wind, etc. His urine did not contain either sugar or albumen, and except for an occasional asystole, which he was conscious of, there was nothing abnormal about him.

On my next seeing him, his chest and abdomen, arms and legs, were covered anteriorly and posteriorly by a purple papular rash, with a tendency to form plaques. Those on the anterior surface were the size of a florin, and somewhat smaller on the back. They were discrete papulæ, but as I have stated, the tendency was to the group formation. The rash was dry except under the prepuce and between the nates, and showed especially over the front of the thorax. Wickam's striation, the lilac colour referred to by several writers, was here confined to the anterior surface of thighs. The itching was

inflammation has settled down.—(*Journal des Praticiens*, January 12, 1929, p. 25.)

The Treatment of Sterility in Women.

C. Mazer and J. Hoffman have carried out an analysis of 500 cases of sterility in women and have come to the following conclusions: In the United States one out of seven marriages remains barren. The male bears a direct responsibility in about 25 per cent. of the cases; indirectly he is responsible for most of the infections that result in female sterility. The incidence of non-potency and sterosis of the fallopian tubes in sterile women is about 33 per cent.; intra-uterine insufflation shows a direct place as a therapeutic measure in these cases. Chronic endocervicitis accounts for about 10 per cent. of the cases; thick, tenacious, purulent cervical discharges may either destroy the spermatozoa or block their progress towards the fundus of the uterus. Of 50 cases in which this condition was present, 26 became pregnant soon after its correction. Endocrine dysfunction, dating back to puberty, as evidenced by undevelopment of the genital organs, was found in about 14 per cent. of the cases; endocrine dysfunction of later development, mostly due to metabolic derangements, was found in about 4 per cent. Uterine fibroids, malpositions of the uterus, and uterine cysts were the responsible agents in but few cases. Foci of infection were the apparent cause of repeated abortions and prematurity in most of the cases of relative sterility; syphilis bore this responsibility in only six cases. In one-fifth of the cases no apparent cause for the sterility could be found, and without any definite treatment one-third of this group eventually bore one or more viable children. —(*Medical Journal and Record* [New York], January 16, 1929, p. 90.)

The Treatment of Sterility in Women.

I. C. Rubin is of opinion that the tubal insufflation of carbon dioxide gas has a definite value in the treatment of sterility in women, as well as a diagnostic value. Among 2,000 cases in whom insufflation was carried out, conception took place within six months after treatment in 152, and in 93 of these conception took place within two months. No other therapeutic measures were used in these cases, many of whom had been sterile for long periods of time. —(*New England Journal of Medicine*, November 1, 1928, p. 808.)

The Bactericidal Properties of Zinc Oxide.

H. Haxthausen notes that zinc oxide is probably the substance most generally in use in the local treatment of skin diseases, both unmixed and in conjunction with other substances. Although it occupies such a prominent position in dermatology, we really know very little indeed about its action on the skin. It forms, purely mechanically, a protective covering for the skin. It has the power to bind many substances through adsorption, whereby it can counteract the effects on the skin partly of external, active, chemical irritants, and partly also of irritating substances which may possibly develop in the skin itself under pathological conditions. Its

Practical Notes.

The Treatment of Malignant Disease with Lead.

L. C. Knox has treated a series of 40 patients suffering from various types of malignant tumours by the intravenous administration of colloidal lead after the method of Blair Bell. Many of the patients received large doses of X-rays simultaneously with or subsequent to the administration of the lead. Of the 40 patients four are at present wholly free from physical signs of their original disease; the time, however, which has elapsed since the disappearance of their tumours is too short to permit the assumption that a cure has been obtained. Several other patients have been benefited temporarily; in the remaining 34 patients, death was due to the progress of the neoplasms or to some extraneous lesion. In no case did death or serious complications result from the use of the lead. No selection of patients was made, except to exclude the moribund and those who had advanced renal lesions. The combination of lead and X-rays is often more effective against malignant disease than either used alone.—(*Journal of the American Medical Association*, January 12, 1928, p. 106.)

The Treatment of Acute Frontal Sinusitis.

E. Feldstein points out that the treatment of acute frontal sinusitis—which is a common complication of influenza or of a neglected cold—is medical rather than surgical. Catheterization or lavage of the sinus should never be done in the acute stage, and the radical operation is absolutely contraindicated; the utmost that should be done in the way of surgical treatment is an incision with a bistoury in the rare cases where the abscess is pointing externally. The patient should be put to bed or at least kept to his room, hot fomentations applied to the affected parts, and half-a-dozen times a day the nasal passages should be sprayed with such a preparation as the following:—

R ^x	Ext hyoseyam.	-	-	-	-	g 0.50 (grs. vii.ss.)
	Sol. adrenalin.	1-1000	-	-	-	m 10
	Cocaine hydrochlor.	-	-	-	-	g. 0.30 (grs. v.)
	Glycerine	-	-	-	-	} aa g. 10 (5 ii.ss.)
	Aq. destillat.	-	-	-	-	

Ten minutes after using this spray a menthol inhalation should be given. Aspirin, antipyrine or, better still, the following prescription, will relieve the attacks of pain:—

R ^x	Pyramidon	-	-	-	-	g. 0.30 (grs. v.)
	Quinine valerianate	-	-	-	-	g. 0.20 (grs. iii.)
	Caffeine	-	-	-	-	g. 0.05 (grs. $\frac{1}{4}$)

This should be put up in the form of a cachet, and 3 or 4 cachets taken in the course of a day. Surgical treatment may be necessary for a complete cure and should be carried out after the acute in-

PRACTICAL NOTES

The Treatment of Acute Lung Abscess by Bronchoscopy.

L. F. Johnson gives details of four cases of acute lung abscess treated successfully by bronchoscopy and aspirating pus. In the author's clinic the injection of lipiodol has been found to be disappointing in ascertaining the localization and the delineation of lung abscess. Just what step or steps in bronchoscopy are really responsible for the benefits derived in these cases is still a matter of conjecture; but it seems possible that the mere passing of the bronchoscope may dilate the dependent bronchus or bronchi and thus more adequately drain the infected area in the same way that dilatation of a ureter is helpful in the treatment of pyelitis. Certainly, however, the change that takes place in acute lung abscess following bronchoscopy is dramatic. No general anaesthesia was used in the treatment of lung abscess, the patient being moderately narcotized with morphine and scopolomine, and the superior laryngeal nerves cocainized in either pyriform sinus before passing the bronchoscope.—(*New England Journal of Medicine*, January 10, 1929, p. 64.)

The Treatment of Hæmaturia.

V. Blum compares and contrasts the symptoms, signs and treatment of hæmorrhage from various parts of the urinary tract. He emphasizes the fact that whatever solution is used for washing out the bladder in cases of hæmorrhage from that organ, it should be used as hot as the patient can tolerate. Dr. Blum recommends the injection of 1-5 c.cm. of the following hæmostatic and sedative solution into the bladder after it has been washed out:—

R	Adrenalin. hydrochlor.	-	-	-	g. 0.1 (m ii)
	Sod. chlorat.	-	-	-	g. 0.7 (grs. x)
	Chloreton.	-	-	-	g. 0.5 (grs. viii)
	Aq. dest.	-	-	-	g. 100 (3 iv)

This solution can also be used diluted one in ten to wash out the bladder, though tannic acid, 10 parts to 1,000, or silver nitrate 0.20-0.50 to 500 are suggested as equally efficacious for this purpose.—(*Wiener Klinische Wochenschrift*, December 6, 1928, p. 1,683.)

The Treatment by Diathermy of Ulcerative X-ray and Radium Dermatitis.

H. Bordier has brought about successful results in treating by diathermy patients who have developed ulcerative dermatitis after having received X-ray or radium treatment (he does not include radiographers and practitioners who regularly use X-rays or radium and have in consequence developed similar lesions). The author states that diathermy is the only method of treatment which has the power of stimulating atonic ulcers which have no tendency to heal up of their own accord; ultra-violet rays, on the other hand, are in his opinion harmful and absolutely contraindicated.—(*Paris Médical*, November 10, 1928, p. 402.)

bactericidal properties, however, are of greater significance than is commonly supposed. A series of experiments carried out by the author shows that the bactericidal properties of zinc oxide depend on the presence of acid; and while it is almost neutral so far as the actual cells of the skin are concerned, it is split up by the acid-producing microbes into disinfectant compounds.—(*British Journal of Dermatology and Syphilis*, December, 1928, p. 497.)

The Treatment of Urticaria.

A. P. Godinho considers that one of the factors concerned in the production of urticaria is an acidosis and, therefore, in view of the unknown etiology of the condition, he has tried treating these cases with large doses of alkalis in the form of sodium bicarbonate. He gives a half to one teaspoonful three times a day for one to two weeks, according to the severity of the case. In very severe cases intravenous injections of from 1 to 20 c.cm. are given. Good results have been obtained in all cases of urticaria, and in other skin conditions such as eczema and senile pruritis the distressing irritation was much relieved by treatment with the alkali.—(*Schweizerische Medizinische Wochenschrift*, October 27, 1928, p. 1,060.)

The Treatment of Diabetes Insipidus.

A. and L. Choay recommend that diabetes insipidus should be treated by the nasal administration of powdered posterior lobe of the pituitary gland. The posterior lobes of beef pituitary glands are ground and dried without heat in a vacuum, and the powder used is made by pulverizing this preparation. From 15 to 20 cg. of this powder is used daily at six-hourly intervals, dividing the quantity into three doses of 4 cg., and a dose, taken at bedtime, twice as large as the others (8 cg.). Some patients are also given an injection of pituitary extract. The authors have been employing this treatment for five years and report many successes.—(*La Presse Médicale*, September 12, 1928, p. 1,155.)

The Treatment of Post-Operative Bronchopneumonia.

M. W. Binger, E. Starr Judd, A. B. Moore and R. M. Wilder publish a report on the value of oxygen in the treatment of post-operative bronchopneumonia. The authors observed 205 cases of post-operative bronchopneumonia in which the patients were treated with oxygen; the diagnosis was confirmed in most instances by radiograms. If this series of cases be divided arbitrarily into those in which treatment with oxygen was started before the fifth day after operation, and those in which it was started after the fourth day, the mortality in the latter group is six times as high as that in the former group—74 per cent. as opposed to 12 per cent. Since the introduction of this method of treatment the mortality of post-operative pneumonia has been definitely reduced. The authors conclude that the administration of oxygen immediately after operation and before the development of pulmonary lesions is an effective method for preventing the occurrence of pulmonary complications.—(*Archives of Surgery*, December, 1928, p. 1,047.)

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Reviews of Books.

Chronic (Non-Tuberculous) Arthritis: Pathology and Principles of Modern Treatment. By A. G. TIMBRELL FISHER, M.C., F.R.C.S. Pp. 232. Illustrations 186 (1 coloured). London: H. K. Lewis & Co. 25s.

WE have learned to expect from Mr. Timbrell Fisher concise and apposite treatment of those subjects on which he writes, and the volume now before us satisfies fully our expectations. It is, in our opinion, the best work he has done so far. Every modern aspect of this distressing disease is reviewed, and throughout the book there is displayed a due sense of proportion. Especial features are the details of the numerous experiments made by the author in his researches on the pathology and physiology of joints, and the appearances in normal and diseased joints are rendered perfectly clear by numerous beautiful plates and figures. The chapter on the etiology of this affection is scientific and comprehensive, and Mr. Timbrell Fisher has given due weight to each of the varying factors in its production. We also note with much satisfaction that he dwells insistently on the "prevention of deformity." He speaks of it as "one of inestimable importance." Yet, despite the sustained efforts of many orthopædic surgeons, it has not yet been appreciated as it should be by the majority of our profession. The factors operating in the production of deformity must be fully understood, and then there can be no difficulty in anticipating and preventing it. Very frequently the simplest measures suffice for this purpose, and the patient is saved much disability and a great deal of suffering. We commend this volume most heartily to our *confrères*, and we are of opinion that there is much need for such a scientific and clear exposition of a difficult subject.

A. H. T.

A Textbook of Medicine. By various authors. Edited by J. J. CONYBEARE, M.C., M.D., F.R.C.P. Pp. xv and 976. Edinburgh: E. and S. Livingstone. 22s. 6d. net.

THE aim of this textbook of medicine is clearly stated in the preface; it is to provide within as small a compass and at as low a price as possible the essentials of medicine without producing anything in the nature of a synopsis. To succeed in such a task might well tax the ingenuity of the most capable of editors. Dr. Conybeare has produced a volume which, with its 976 pages, certainly cannot be accused of resembling a synopsis, and which reasonably well supplies the essentials of medicine in a not unpleasing form. There is, on the whole, less discontinuity in manner of presentation than might be expected from the fact that the book is the work of more than one author. It is a pity that so much space is devoted to biochemical tests, as, for example, the Van den Bergh reaction, full details of which are rather unnecessarily

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and, unfortunately, inaccurately given. Also, the lengthy description of acidosis and alkalosis is out of proportion to the space devoted to subject-matter of more practical importance. The consideration of tuberculosis as a whole under one heading, instead of under its manifestations in the various systems, is somewhat of an innovation and a good one. Only too often is the student given the impression from his textbooks that a tuberculous process in the kidneys, for example, must differ fundamentally from tuberculosis in the lungs because it occurs in a different organ. The section on diseases of infants might well be amplified in future editions; it contains many valuable points about infant feeding. Throughout the book therapeutics are given a prominent place, and many valuable prescriptions are suggested. It is questionable, however, whether an appendix on examination for life assurance should be included in a textbook for students. The book should prove very popular; it is easy to read and the print is excellent. If in future editions each section were prefaced by a short description of methods of examination, as is done in the section on cardiovascular diseases, the value of the book would be greatly enhanced.

A Textbook of Urology for Students and Practitioners. By DANIEL N. EISENDRATH, M.D., and HARRY C. ROLNICK, M.D. Pp. vi and 942. London: J. B. Lippincott Company. 42s. net.

THIS book begins by dealing with the embryology, anatomy and physiology of the urinary organs. Then follow chapters on terminology, urological instruments, minor technique, urethroscopy and cystoscopy, radiography, laboratory methods, anæsthesia and urological study. These are succeeded by many more on gonorrhœa, syphilis, the diseases of the male genitalia, bladder, ureter and kidney. Finally, the various operations in connection with the urinary tract organs are described. The book, as its title implies, is intended for students and practitioners; but we cannot help feeling that, although it will repay reading by the general surgeon interested in urology, it is hardly so suitable for the student or general practitioner because of the insufficient attention given to preliminary and everyday subjects—such important matters as self-catheterization and chronic posterior urethritis, for example, being inadequately treated. The book is admirably produced, and contains seven hundred illustrations in black and white and eleven in colour, many of them really beautiful. With several of the rather unusual ideas expressed the reviewer is in hearty agreement.

The British Journal of Urology. Edited by FRANK KIDD, M.Ch., F.R.C.S., and H. P. WINSBURY WHITE, F.R.C.S. London: Constable & Co. 20s. annually.

We welcome the appearance of the first number of this well-illustrated new quarterly, under distinguished editorship and with a very strong editorial committee. Such a journal is a real necessity to medical education and progress, as it is impossible for a general medical journal, such as *THE PRACTITIONER*, to give adequate space to all the details of the modern developments of the various specialties. We commend it to our readers.

Preparations, Inventions, Etc.

VIYELLA SHEETS.

(London: Messrs. William Hollins & Co., Ltd., Viyella House, Old Change, Cheapside, E.C.4.)

Most practitioners have patients—sufferers from rheumatism, neuritis, sciatica, nephritis, pneumonia, etc.—whom they know would be much better off sleeping between blankets, but the patients frequently dislike the irritation and the apparent weight of the blankets so much that they put up instead with the chilly feeling of linen or cotton sheets. In view of this fact, we have been asked to make a test of a pair of Viyella sheets, as being a happy medium between the heavy blanket and the cold sheet. The manufacturers inform us that the Viyella fabric is a careful blending of certain kinds and certain proportions of wools and cottons, and suggest that such a yarn is hygienically sound, in that the cottons absorb moisture and the wools radiate it. We may say at once that we were frankly surprised at the result of our experience of these sheets. There was no suggestion of weight or irritation, and there was an unusual cosiness—that seems to us the most appropriate word—in getting into bed between Viyella sheets. The feeling of soothing and comfort which ensued ought, we imagine, of itself to do good to invalids and convalescents. In addition, these sheets are unshrinkable, are durable, and are said actually to improve with washing.

MENISCOTOMY KNIFE.

(London: Messrs. Allen and Hanburys, Ltd., 48 Wigmore St., W.1.)

Mr. H. A. T. Fairbank, F.R.C.S., writes:—Accurate division of the posterior end of the so-called bucket-handle lesion of a semilunar cartilage close to its attachment to the bone is difficult or impossible with a straight tenotome or other knife. The advisability of dividing the cartilage close to the tibia arises from the occasional finding of a tag at the back of the joint, with its sole attachment to the rest of the cartilage close to the bone. To avoid such a tag being missed, the dividing knife must cut close to the bone in an oblique plane. The curved end of a Macdonald's dissector has been found a useful instrument for determining the precise direction in which the knife should cut. Messrs. Allen and Hanburys have made for me a knife with a similar curve, a probe point and a short cutting edge, and this has been found to answer the purpose admirably. Since it is wiser not to use a double-edged knife inside the knee joint, the knives are made in pairs, to cut to the right and left respectively.

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The Methods of Investigating a Urological Case.

By C. A. R. NITCH, M.S., F.R.C.S.

Surgeon to St. Thomas's Hospital; Consulting Surgeon to the Evelina Hospital; late Examiner in Surgery, London University; late President of the Sections of Surgery and of Urology of the Royal Society of Medicine, etc.

THE great advance in diagnostic methods in recent years has been the most important factor in elevating urology to the precise and accurate science it has now become. A correct diagnosis can be made only by obtaining a full and complete history, by making a careful note of the relevant facts and following this by a thorough general and local examination, and when necessary by urethroscopy, cystoscopy and radiography as well.

The modern student is taught to regard urology as an exact science and to tackle its many problems by scientific methods. The majority of the profession have also come to realize and value the methods of making an accurate diagnosis which are now at their command, but there are still some who, for example, treat cystitis

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empirically from the outset instead of ascertaining its cause by the aid of microscopy, bacteriology and cystoscopy. Oxaluria, the colon bacillus, and a foreign body in the bladder all produce more or less similar symptoms which can be relieved temporarily by drugs, but the problem can only be solved by scientific means. Again, a patient with hæmaturia is still too often treated immediately with hæmostatics instead of being subjected to a searching examination with the object of ascertaining the exact source and cause of the hæmorrhage. A papilloma of the bladder, when small, can be destroyed with one touch of the diathermy electrode; but if the painless hæmaturia which is its only early symptom is treated medicinally, the growth will have increased and probably also multiplied by the time the practitioner realizes that his favourite drug has failed him.

Vaccines are often of great value, but they are quite useless when administered to a case in which the exact cause of the infection has not been discovered. Recently two patients were referred to me with chronic cystitis, who had been treated without benefit for months with vaccines and the whole gamut of urinary antiseptics, when the infection was secondary to obstruction at the neck of the bladder with over 20 oz. of residual urine! This would never have happened had a proper examination been made in the first instance.

In every disease diagnosis is the key to treatment, and in a urological case this key can only be fashioned by a preliminary methodical examination based on a formulated plan. The greater part of this examination lies easily within the scope of the general practitioner and can be carried out without any special instruments; when completed he will be in a position to decide on the necessity or otherwise of further instrumental investigation.

UROLOGICAL INVESTIGATION

The object of this article in *THE PRACTITIONER* is, therefore, in the first place to set out a plan of examination, secondly to analyse and elaborate it, and thirdly to indicate the necessity for specialized investigations.

PLAN OF EXAMINATION.

- (1) Nature of complaint.
- (2) Family history and past history.
- (3) The symptoms and their method of onset.
- (4) General examination.
- (5) Local examination.
- (6) Examination of the secretions and excretions.
- (7) Instrumental and radiographic examinations.

(1) NATURE OF COMPLAINT.

The patient should be allowed to state in his own words the nature of his complaint and the important short signs and symptoms he has noticed. Do not cut him unless he is unduly loquacious, for valuable information is sometimes concealed in a mass of verbiage.

(2) FAMILY HISTORY AND PAST HISTORY.

Inquiries should be made regarding the health, age and, if not alive, the cause of death of all near relatives, particular attention being paid to syphilis, tubercle, lithiasis, diabetes, Bright's disease and mental and nervous disturbances. Also the possibility must not be overlooked of contagion from syphilis, gonorrhœa or tubercle in a member of the family living in the house.

It is important to ascertain if the patient has lived abroad and suffered from any illnesses peculiar to the district. Bilharziasis is endemic in Egypt and certain parts of Natal; lithiasis and "gravel" are common in India, and hydatids in Australia.

The age of the patient has an important bearing on the diagnosis, as certain lesions of the genito-urinary tract are peculiar to the three main periods of life.

In infancy and childhood one must be on the lookout

for congenital malformations and their effects, for vesical calculus and microbial infections. Renal tuberculosis is by no means uncommon, but is often associated with gross lesions in other parts of the body. Pyuria in children which does not soon respond to treatment requires careful investigation, for it may be due to congenital stricture of the urethra, to the persistence of valvular folds in the prostatic urethra, to vesical calculus, or to stenosis of the ureter producing pyoureter and pyonephrosis.

As age advances renal tuberculosis becomes increasingly common and, in addition to the many other diseases of the urinary tract, the effects of the gonococcus on the urethra, prostate and seminal vesicles come into prominence. In old age, enlargement of the prostate, vesical calculus, malignant disease and the consequences of urethral stricture claim priority.

Careful inquiries should be made regarding any acute illness the patient may have had as a child, particularly the specific fevers, for they are often followed by nephritis. Orchitis and oöphoritis occur as a complication of mumps more often in the adult than in the child.

Any venereal history must carefully be investigated both as regards the form of the disease and the method and duration of treatment. Energetic irrigation may have driven a gonococcal infection into the prostate and seminal vesicles, where it lies more or less dormant for years but always ready to light up and cause puzzling symptoms when given the proper stimulus. An inflammatory urethral stricture is often long in following its cause. It is hardly necessary to point out that a negative Wassermann is of no value and that the spirochaete may suddenly wake into activity as long as twenty years after the original infection.

Inquiries should be made into the habits and occupation of the patient, his relaxations, and his indulgences in food and alcohol, for all these details

have a bearing both on the condition of his arteries and his kidneys and his suitability for a possible operation. The man of sedentary habits and city dinners requires careful investigation and treatment before a serious operation such as prostatectomy. Some, from either nervousness, necessity or habit, refrain from emptying the bladder for many hours, with the result that it becomes permanently over-distended and never empties properly. Such a bladder readily becomes the seat of a chronic and incurable infection. In women the urinary history during pregnancy and the puerperium should be elicited.

When the family and past histories have been obtained the patient should be allowed to describe his symptoms in detail, their onset and their course.

(3) THE SYMPTOMS AND THEIR METHOD OF ONSET.

The symptoms as described by the patient are often very unreliable and may confuse the examiner by drawing his attention from some important detail which the patient regards as trivial, but they are of great value when used as indicators to judicious questions and proper physical examination. In some instances the symptoms are typical and frankly diagnostic; while in others they may be misleading, as, for example, urethral pain and strangury which focuses the attention of both patient and surgeon on the bladder when the real cause is either uterine displacement, hæmorrhoids, a pelvic appendix, a calcified tuberculous gland irritating the nerves of the bladder, or prolapse of the bladder wall through one of the hernial rings. Again, renal pain is sometimes referred entirely to the healthy kidney particularly in tuberculosis and calculus, or it may be referred to some part of the abdominal wall and accompanied by such acute intestinal symptoms that the actual pathological condition is entirely missed. The chief symptoms and

signs described by the patient will be either pain, a swelling, a urethral discharge, or disturbances of micturition and changes in the appearance of the urine.

Pain may be local or referred; when local and stationary it is always indicative of some pathological change; when referred it generally requires careful and often special investigation to make certain that it originates in the genito-urinary tract. Certain types of pain are peculiar to different parts of the genito-urinary tract and are best described according to their site and origin.

Urethral pain during micturition is due to inflammation; *before* micturition, to obstruction from a stricture, a stone, a foreign body or a growth. Referred pain *along the urethra* occurs both during and at the end of micturition in cystitis and is generally described as scalding. Pain at the tip of the penis is usually caused by irritation of the vesical neck and sometimes by a stone impacted in the lower end of the ureter, but it may be due to inflammatory and other changes in the posterior urethra, prostatic calculi and malignant disease.

Perineal pain if not of anal or rectal origin is strongly suggestive of an inflammatory or other lesion of either the prostate, the posterior urethra, the seminal vesicles or the base of the bladder.

Groin pain is generally due to inflammation of the cord or testis, but is sometimes felt in carcinoma of the prostate, in prostatitis and spermatoecystitis.

Suprapubic pain is seldom a pronounced symptom in urinary diseases, but is sometimes present in carcinoma of the prostate, in chronic cystitis with distention, and when the upper part of the bladder is the seat of an inflamed diverticulum. It may be referred from a distance, and in one case was the sole symptom of a gall-bladder packed with stones—a problem that was only solved by abdominal exploration after an

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exhaustive examination of the urinary tract.

Renal and ureteric pain are characteristic when local and associated with symptoms peculiar to the conditions from which they arise, but when referred they may be very misleading. I once saw a man who suffered from attacks of sudden agonizing pain located precisely to the upper end of the scar of a herniotomy wound accompanied by exquisite tenderness at the same spot. There were no other symptoms of any kind. A skiagram of the kidney revealed the cause in a spiked oxalate calculus.

Renal pain is generally located to a triangular area having its base along the erector spinæ between the last rib and the crest of the ilium and its apex at the lower border of the ribs anteriorly. From this triangular area the pain may be referred along the course of the ureter to the inguinal region, the testis or labium, the urethra, the anterior part of the thigh and leg and the heel. Occasionally it is referred to the opposite healthy kidney, the diseased one being painless. Tenderness in the angle between the last rib and the erector spinæ is typically renal.

Ureteric pain is either felt along the line of the ureter or is referred to the groin and testis or labium. When the lower end of the ureter is implicated the pain may be felt at the base of the bladder, along the urethra, at the external meatus or in the perineum. Renal and ureteric colic are generally accompanied by muscular rigidity, vomiting and abnormal intestinal movements, and may simulate acute appendicitis or intestinal obstruction. If it be remembered that the patient with colic rolls about in agony and the patient with an acute abdomen keeps still, a mistaken diagnosis is not likely to occur.

Another diagnostic aid of great value is Rovsing's sign. This serves to distinguish between a renal and an acute intraperitoneal lesion on the right side. It is

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elicited by firm massage of the descending colon with the flat hand; if this causes pain in the right iliac fossa it signifies localized peritonitis, usually due to acute appendicitis; if, however, the massage does not cause pain in the right iliac fossa, the lesion is probably renal or ureteric, but may be intraperitoneal. A renal or ureteric affection will be confirmed by tenderness on pressure in the angle between the last rib and the erector spinæ. The great value of this sign is well illustrated by the following case:—

A boy of 14 had severe pain in the right side of the abdomen and muscular rigidity suggestive of acute appendicitis, but he also had frequency of micturition, pyuria and swarms of *B. coli* in the urine; there was slight tenderness in the costo-muscular angle. Was this a case of acute pyelitis only, or of pyelitis complicated by acute appendicitis? Rovsing's sign was positive and was the deciding factor for an immediate operation, when a perforated gangrenous appendix was found adherent to the ureter at the brim of the pelvis.

Pain at the end of micturition accompanied by an intense desire to urinate is again typical of cystitis and trigonitis. A pricking pain referred to the external meatus suggests a vesical calculus or foreign body, especially if aggravated by movement and change of position. Severe shooting pain in the bladder and urethra may be due to organic disease of the spine or the central nervous system. Renal pain relieved by recumbency and either relieved or increased by change of position points to a mobile kidney, a renal tumour, intermittent hydronephrosis and horse-shoe kidney.

Disturbances of micturition figure largely in urological cases and must be subjected to detailed inquiries after the patient has described the chief peculiarity. He should therefore be asked about abnormal frequency (pollakiuria), urgency, excessive or diminished secretion (polyuria and oliguria), and painful or difficult micturition (dysuria).

Alterations in the urinary stream and loss of power occur in obstruction at the neck of the bladder and in

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the urethra, and in diseases of the nervous system. When sudden, it is generally due to an impacted stone or portion of growth; when gradual and progressive, to enlarged prostate, stricture or tabes.

Frequency of micturition in general may be due to habit; to changes in temperature, especially in those who have lived in the tropics; to nervousness; to the polyuria of diabetes, chronic nephritis, and diuretics such as tea, coffee, alcohol, etc.; to irritating conditions of the urine produced by blood, by the sudden discharge of pus from an infected kidney or perivesical abscess, by drugs and by oxalates, phosphates and uric acid crystals; to diminished capacity of the bladder by pressure from without, or by inflammation of its walls and lining membrane; to stone, new growths and foreign bodies, in all of which cystitis is the usual cause of the frequency; to diseases of the prostate, seminal vesicles and posterior urethra; to hernia of the bladder, cystocele and uterine displacements; and reflexly to worms and other anal and vulval sources of irritation.

Though frequency often occurs in nervous diseases it is seldom pronounced in tabes, the disease in which the bladder is most often affected. There may be slight initial frequency and urgency, but generally there is progressive loss of power with diminished desire to micturate, ending in sudden complete retention or incontinence from overflow.

Frequency may be diurnal, nocturnal or both. *Diurnal* frequency occurs in nervousness and sexual neurasthenia, in vesical calculus, and in *mild* inflammation of the bladder, prostate and urethra. *Nocturnal* frequency is pronounced in enlarged prostate, renal tuberculosis and *severe* cystitis and prostatitis. *Frequency by day and night* is due to acute inflammation of the lower urinary tract (cystitis, prostatitis, posterior urethritis, etc.), to reflex irritation such as worms, and to organic polyuria. *The frequency of*

enlarged prostate is characteristic. Though present during the day it is not sufficient to attract attention. At night the patient sleeps for several hours and then wakes to urinate at more or less frequent intervals till he rises in the morning. *Frequency and urgency* indicate irritation of the posterior urethra and vesical neck.

Dysuria is symptomatic of obstruction or atony. The commonest obstructive causes are stricture, diseases of the prostate, impacted calculi, chronic inflammatory thickening of the vesical neck and congenital malformations. It is useful to remember that the patient with a stricture strains throughout micturition, with a vesical calculus at the end and with enlarged prostate at the beginning.

Painful micturition denotes inflammation or irritation of the urethra and bladder.

Oliguria is a symptom of cardio-vascular and organic renal disease.

The patient must next be asked if any changes in the appearance of the urine have been noticed and how and when they have occurred. The chief abnormal constituents are pus, blood and crystals.

Pyuria.—Pus in lumps and flakes at the beginning of micturition comes from the urethra or prostate; if, in addition, a further quantity is voided at the end of micturition it is almost certainly from the prostate or seminal vesicles. Purulent urine is passed in all varieties of cystitis, and is generally accompanied by terminal pain, but pus from the kidneys may be passed in large quantities without any symptoms of cystitis. An intermittent purulent urine indicates sacculus of the bladder, perivesical suppuration, obstructive pyonephrosis, or that form of renal tuberculosis which is alternately open and closed. In the aged, sudden apyrexial cystitis with its accompanying pyuria is very suggestive of vesical carcinoma.

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Hæmaturia.—As the patient will naturally ascribe any red coloration of the urine to blood the practitioner should inquire carefully into its character, possible cause, onset, duration, presence of clots, etc., and should bear in mind the possibility of the pigmentation being due to hæmoglobinuria or to excessive indulgence in sweets stained with eosin. He should ask if the patient has resided in any part of the world in which bilharziasis is endemic; also realizing as he does the innumerable causes of hæmaturia, he must endeavour to eliminate by appropriate questions such causes as hæmophilia, purpura, scurvy, chronic nephritis, arterio-sclerosis, foods or fruits causing oxaluria, and medicines containing hexamine.

Blood from the kidney is usually intimately mixed with the urine and gives it a brown or red tinge; blood from the bladder is generally bright, and on standing forms a red precipitate at the bottom of the glass.

Hæmorrhage at the commencement of micturition is from that portion of the canal in front of the compressor urethræ; terminal hæmorrhage may come from the posterior urethra, the verumontanum, the prostate, the seminal vesicles, or from a papilloma at the internal meatus.

Painless hæmaturia of *sudden onset* in a young subject may be due to rupture of a renal arteriole, in an older patient to arteriosclerosis or Bright's disease. In some cases of chronic interstitial nephritis hæmaturia is the initial symptom and may be so profuse as to endanger life. Painless *intermittent* hæmaturia is characteristic of papilloma of the bladder. Constant slight hæmorrhage is very suggestive of vesical carcinoma.

Hæmorrhage due to oxalates and uric acid is sudden in onset and usually accompanied by renal pain, but sometimes only by slight irritation of the bladder. The association of sudden hæmaturia with lumbar

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means negligible. The chief clinical signs of a defective renal function are thirst, disinclination for food, particularly meat, a dry tongue and a sallow complexion. In my opinion these signs are often more valuable than chemical tests, and therefore particular attention should be directed towards them. The hernial regions should next be inspected, and the heart and lungs examined if necessary.

The patient then lies on a couch and the whole abdomen is carefully palpated. If the bladder is distended (and whenever possible the patient should always be told not to pass urine before examination) the patient should empty it as completely as possible, provided the symptoms do not point to the urethra or prostate when either the three-glass test or an estimation of residual urine will be required at a later stage. After micturition, palpation will show if the bladder has been more or less completely emptied. The kidneys are then carefully examined bimanually, and any abnormalities in their position, mobility, size, shape and sensitiveness noted. The presence or absence of tenderness on pressure in the angle between the last rib and the erector spinæ should be tested. The inguinal glands should be examined, for amongst other regions they drain the urethra, penis and skin of the external genitals; they are sometimes enlarged, and often hard and shotty in established carcinoma of the prostate. The lymphatics of the testicles enter the iliac and lumbar glands; enlargement of them will have been detected in a thin patient during the abdominal examination.

The external genitals must now be carefully inspected and examined. A malignant renal growth sometimes gives rise to a varicocele which differs from the common variety in not disappearing with recumbency. Gross malformations and variations in size and shape will be detected easily, but lesser developmental defects and

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pain generally signifies a renal origin, but this is not always the case, for ureteric calculus or a papilloma at the vesical orifice of the ureter can cause identical symptoms.

Profuse renal hæmorrhage without previous symptoms of stone occurs in papilloma of the renal pelvis, angioma of a papilla, surgical tuberculosis in which it is sometimes the first symptom, malignant growth and aneurysm of the renal artery.

From the foregoing it will be realized that the cause and source of hæmaturia can only be discovered by radiography and by the aid of the urethroscope and cystoscope, that these diagnostic aids should be employed as soon as possible, and that no operation should be performed until the site of the bleeding has been located by their means.

Crystals of calcium oxalate and uric acid, when unaccompanied by hæmaturia, will probably only attract attention by the irritation they cause, and in the case of uric acid by their colour. In some cases of phosphaturia the urine is cloudy only after meals.

Persistent haziness is generally due to colon bacilluria; occasional haziness combined with frequency in a young adult is very suggestive of renal tuberculosis.

(4) GENERAL AND (5) LOCAL EXAMINATION.

The appearance and bearing of the patient will already have been noticed, but special attention should now be paid to the complexion, the mental attitude, and to signs of wasting or dehydration. The tongue should be inspected and the mouth examined for septic foci. The patient must be questioned about his appetite and desire for fluids. The blood pressure should be taken and the condition of the arteries noted. The knee jerks and pupil reflexes should never be omitted, for the number of cases that have been operated on from neglect of this simple precaution is by no

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of the whole urethra, glass No. 2 contains the bladder urine, and glass No. 3 contains bladder urine together with normal and abnormal secretions squeezed out of the prostate and vesicles. A smear can easily be made from the urethra and from deposits in the urines, and either sent to a pathologist or stained with carbol-thionin and examined at once if the practitioner possesses a $\frac{1}{12}$ -inch oil immersion lens. Intra- and extra-cellular diplococci, stained deep blue, are almost certainly gonococci; but should it be important to confirm this the slide, together with a fresh smear if possible, should be sent to a pathologist for decolorization and gram-staining.

The practitioner cannot be too careful or cautious in investigating the cause of urethritis in an adult and in making notes and preserving documents relating thereto. In females the cervix should be inspected through a speculum, and discharge from it examined microscopically. When the history and symptoms point to simple prostatic obstruction a gum-elastic bi-coudé catheter is passed immediately after the bladder has been emptied naturally, in order to ascertain the amount of residual urine if any.

The male patient is next placed in the genu-pectoral position and the anus carefully examined for piles, excoriations, etc. A rectal examination, which should be bimanual, is then made with a well-lubricated gloved finger. Having first ascertained the presence or absence of internal piles and any growth of abnormality of the rectum, the prostate is carefully palpated. In young men it is sometimes so soft and thin that the back of the pubis is felt with hardly any intervening tissue, and at first touch gives the impression that a hard prostate is being palpated; but the absence of steep sides to the lateral portions makes the diagnosis easy, and if there is the least doubt it can be cleared up at once by another rectal examination after the passage

pathological lesions may require a careful search. The external meatus should be inspected with a view to noting both its size and the presence or absence of a discharge. A discharge may be profuse and obvious, or scanty and only rendered visible by massaging the urethra or by scraping it gently with a platinum loop. In every case a smear should be made for microscopical examination. Thickening along the course of the urethra is characteristic of long-standing stricture or of a peri-urethral abscess in connection with it.

If the scrotum be devoid of a testis the perineum, groin, inguinal canal and pelvis must be carefully searched, for the examiner should not be content until he has located the missing organ.

A scrotal swelling should be tested for translucency. Primary or idiopathic hydroceles are generally large, secondary hydroceles are always small. Special attention should be paid to the epididymis, and if there is any nodulation, thickness or enlargement the vas should be examined and later the prostate and seminal vesicles. Thickening of the globus major alone may be due to an encysted hydrocele of the epididymis (spermatocele) or to tubercle of hæmic origin. Enlargement of the globus minor is usually tuberculous or infective; when tuberculous it is generally secondary to a focus in the seminal vesicle or prostate, which in turn may be secondary to renal tuberculosis; when infective it is due either to urethritis or to prostatitis and vesiculitis.

The patient is now told to pass into an empty specimen glass all the urine he can, but if his predominant symptoms have been urethral or prostatic the three-glass test should be carried out. Urine is passed in a continuous stream into two glasses, one after the other, taking care not to empty the bladder. The prostate and vesicles are then massaged and the bladder emptied into a third glass. Glass No. 1 contains the washings

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of a catheter.

The prostate should be carefully examined for mobility, elasticity, hardness or softness, nodules or diffuse thickening, and local or general tenderness. The definition of the margins of the lateral lobes, the presence or absence of the vertical interlobar sulcus, and the mobility or attachment of the overlying rectal mucous membrane must also be investigated.

The normal adult prostate is felt as a slight, smooth, moderately movable prominence covered by freely movable rectal mucous membrane and separated into two lateral lobes by a shallow vertical median sulcus. This sulcus becomes deeper in benign senile enlargement involving the lateral lobes, but, of course, is not altered when the enlargement is mainly intra-vesical; it is usually obliterated in malignant disease.

The chronically inflamed prostate is firm, only slightly movable, and generally has some tough nodular inflammatory deposits in one or both lateral lobes. Hard nodules surrounded by more or less normal prostate are very suggestive of tubercle and quite characteristic if the epididymis is also affected. A single calculus is difficult to diagnose by touch alone and requires confirmation by X-rays; but multiple calculi, which are usually small, can be rubbed on each other and feel like grains of uncooked rice in a bag. An abscess is tender and is felt as a soft area in the midst of the generally enlarged tough prostate. Pressure may cause a sudden gush of pus from the urethra. The malignant prostate is seldom much enlarged and is sometimes quite small; it is stony hard, irregular and nodular, and firmly fixed. The median sulcus is absent, and the sulcus generally felt at the edge of the normal lateral lobe is replaced by a firm flat band apparently joining the prostate to the pelvis. This band is composed of lymphatics and cellular tissue infiltrated with carcinoma cells. Occasionally the

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infiltration can be felt spreading upwards on the posterior wall of the bladder. The examiner should remember that carcinoma of the prostate gives rise to early metastases in bones, favourite sites being the lumbar and sacral vertebræ and the pelvis, and so whenever possible he should have these regions X-rayed. Occasionally the primary growth is "silent," and the metastasis is the first indication of its existence.

Below the prostate on each side of the mid-line Cowper's glands can be felt, if enlarged, by grasping the tissues between the finger in the rectum and the thumb on the perineum. The seminal vesicles spread almost horizontally outwards from the upper border of the prostate. When healthy they can hardly be felt, even bimanually; therefore if they are palpable they are almost certainly pathological. The commonest causes of enlargement of the vesicles are chronic gonococcal infection and tubercle. In the former, pus casts and infected fluid can be expressed by massage, but they are not obtainable in the latter as the thickening is due to caseation and fibrosis. Hæmatospermia is a common symptom of tuberculous vesiculitis, but also occurs in chronic inflammation of the verumontanum. In a thin subject it is possible to feel a stone in the lower end of the ureter, pressure often causing a pricking sensation along the urethra. A thickened ureter can sometimes be felt bimanually in both male and female, and when discovered is almost pathognomonic of renal tuberculosis.

(6) EXAMINATION OF THE SECRETIONS AND EXCRETIONS.

The apparatus required for consulting-room examinations consists of a microscope with a $\frac{1}{6}$ -inch and a $\frac{1}{12}$ -inch oil immersion objective, a movable stage, a platinum loop, a small bottle of carbol-thionin or methylene blue, slides and cover slips, and the usual

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reagents for testing urine.

When the patient complains of a urethral discharge or a gleet, a drop is collected from within the urethra with a sterile platinum loop and a thin smear is made on a slide. This is dried, stained for a few minutes with carbol-thionin, washed with tap water, dried by heat and examined with a one-twelfth objective. Organisms are stained deep blue, and if they are diplococci and are both in and around the cells they are certainly gonococci. If the discharge is very scanty the three-glass test is carried out and the debris stained and examined. Little masses of pus called "commas" come from the crypts of the urethra, thin long threads from the prostate.

If the urethra and prostate are not under suspicion a specimen of urine is collected in the ordinary way and submitted to the usual chemical examination. If there is any deposit or alteration in colour a drop should be placed under the microscope and examined with a $\frac{1}{8}$ -inch lens, when blood, pus, crystals, casts, cellular elements, bilharzia ova, etc., can all be seen and identified.

If motile bacilli are noticed they are almost certainly *B. coli* for they are the only ones that can be seen with such a low power. An acid, hazy urine containing pus cells may be due to colon bacilluria or tubercle, and should be subjected to careful examination by a pathologist. Uric acid and oxalate crystals are found in acid urine and can account for a small quantity of pus, but this cannot be accepted for a diagnosis, as both crystals and pus may be secondary to a stone in some part of the urinary tract.

Cloudy, alkaline urine may be due to phosphates, bacteria or pus. Phosphates sink to the bottom of the glass and dissolve on the addition of a few drops of acetic acid, whereas pus and bacteria are unaffected. Ammoniacal urine is due to decomposition of urine in

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the bladder occurring in chronic cystitis caused by obstruction or paralysis. Putrid, alkaline urine may be due to the same cause, or to a vesico-intestinal fistula, or a necrotic vesical growth, but it may also come from a pyonephrosis in which there is a large quantity of pus and retained urine.

(7) INSTRUMENTAL AND RADIOGRAPHIC EXAMINATIONS.

If the history and symptoms point to a stricture, a metal urethral sound should be passed with aseptic precautions after rendering the urethra analgesic by injection of a few drachms of 5 per cent. novocain solution. A medium size is selected, say 18 F., as this is large enough to localize the stricture and blunt enough not to injure the urethra. The bladder sound is seldom used nowadays, its place having been taken by the cystoscope.

Urethroscopy and cystoscopy require special instruments and training, and therefore a description of these important methods of examination has been omitted. It should be realized, however, that practically every urological case may ultimately require one or both of these examinations together with a complete radiological examination. Urethroscopy is required for the diagnosis and treatment of chronic anterior and posterior urethritis, and for locating strictures, tumours, and abnormalities of the canal; it is always indicated in cases with perineal and urethral pain. The cystoscope is required to make and to complete diagnosis, and as a means of catheterizing the ureters and treating various prostatic, vesical, and ureteric conditions. Its use is indicated in every case of hæmaturia; in all inflammatory conditions of the bladder and kidneys, sometimes during but generally after the acute symptoms have subsided; in all cases of suspected stone, neoplasm, and foreign body; and in many cases of

prostatic obstruction.

When the object of the cystoscopy is to discover the source of blood or pus or to ascertain the cause of obscure renal pain, or to localize shadows in the renal and ureteric regions, the examination must be carried out in a place where a good X-ray apparatus is available, for in order to elucidate the problem it will be necessary to catheterize the ureters, to take stereoscopic X-ray photographs, and to make pyelograms. My routine in these cases is as follows:—

The patient is given a good aperient 24 hours beforehand, to clear the bowel for radiography. One hour before examination 15 grammes of urea in 100 c.cm. of water are given by mouth on an empty stomach; this is used as a test of renal function and its diuretic effect also ensures a good flow of urine. As the patient must be conscious when the radiograms are taken, a general anæsthetic is not permissible; should the patient be temperamentally unsuitable for local analgesia, or should the bladder be very irritable, the cystoscopy and catheterization of the ureters can be carried out under gas and oxygen anæsthesia. On introducing the cystoscope a specimen of bladder urine is collected in a sterile tube; the ureters are then catheterized and specimens of urine from each kidney collected in sterile tubes. The three urines are preserved for bacteriological and biochemical examination.

The patient is now placed on the X-ray table and stereoscopic radiograms taken of the kidneys and the pelvic portion of the ureters. The examination is completed with a pyelogram of each kidney.

When carried out in this way the bacteriology and cystology of the urinary tract is investigated, the source of abnormal deposits in the urines is discovered, the function of each kidney is estimated, all shadows in or near the urinary tract are localized, and the shape and size of the pelvis and calyces of the kidneys are ascertained. Further information can be obtained only by operation. In stricture cases a urethrogram is useful. It is made after the injection of 10 c.cm. of heavy lipiodol and shows up irregularities, periurethral abscesses, and false passages. A cystogram is useful in disclosing a diverticulum or an incompetent ureterovesical valve. In the latter the opaque fluid will distend the ureter and kidney as well as the bladder.

Some Ophthalmic Emergencies in General Practice.

By A. MAITLAND RAMSAY, LL.D., M.D., F.R.F.P.S.

Consultant Ophthalmic Surgeon to Glasgow Royal Infirmary.

IN the "New English Dictionary" an emergency is defined as: "A state of things unexpectedly arising and urgently demanding immediate action." The urgent demand for immediate action is the keynote of this article in *THE PRACTITIONER*, and its scope is limited strictly to "first aid."

The necessity for acting with promptness and decision in an emergency is the best test of the skill and resourcefulness of any man, and what is true of all is specially true of a practitioner, who, at any hour of the night or day, may be summoned to an urgent case. If any practitioner will turn over his old memories of the days when he first began practice he will remember the feeling of trepidation with which he responded to these sudden calls: how anxiously he wondered what would be wrong with the patient, fearful that he would be unable to make a diagnosis, or that he would not remember the proper prescription. When we are strange to our work our emotions are apt to get the better of us; we do not see things in true perspective and lack confidence. After a time, however, the exigencies of practice accustom a practitioner to the sudden demands constantly being made upon his skill. He learns to wait and see and, if he be thoughtful and observant, soon accumulates a store of personal experience on which he can always look back for

prostatic obstruction.

When the object of the cystoscopy is to discover the source of blood or pus or to ascertain the cause of obscure renal pain, or to localize shadows in the renal and ureteric regions, the examination must be carried out in a place where a good X-ray apparatus is available, for in order to elucidate the problem it will be necessary to catheterize the ureters, to take stereoscopic X-ray photographs, and to make pyelograms. My routine in these cases is as follows:—

The patient is given a good aperient 24 hours beforehand, to clear the bowel for radiography. One hour before examination 15 grammes of urea in 100 c.cm. of water are given by mouth on an empty stomach; this is used as a test of renal function and its diuretic effect also ensures a good flow of urine. As the patient must be conscious when the radiograms are taken, a general anæsthetic is not permissible; should the patient be temperamentally unsuitable for local analgesia, or should the bladder be very irritable, the cystoscopy and catheterization of the ureters can be carried out under gas and oxygen anæsthesia. On introducing the cystoscope a specimen of bladder urine is collected in a sterile tube; the ureters are then catheterized and specimens of urine from each kidney collected in sterile tubes. The three urines are preserved for bacteriological and biochemical examination.

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guidance when he is in difficulty. He grows more self-reliant as he becomes familiar with the ordinary events in daily practice, but the old feelings of nervous anxiety are prone to recur whenever he is confronted with a case which is strange and unusual. What is true regarding the general emergencies of medical practice is specially true of the emergencies associated with the eye.

If accidents in industrial life be excluded, serious ophthalmic cases occur very seldom in family practice; but they are so alarming when they do occur that the practitioner may well be excused for not feeling quite sure of himself when he is suddenly called upon for advice. Some general practitioners make no attempt to treat these cases. They say openly that they always send their eye patients to a specialist. That is not as it should be, and is very apt to convey a wrong impression. The public do not expect the family doctor to be a specialist, but they have a right to expect him to be capable of giving first aid in an emergency. As a rule a patient has implicit confidence in his family doctor, and when in trouble consults him straightway in the full assurance that he is not only willing, but able, to help. The doctor ought to know, therefore, what to say, what to do, and what to avoid doing when he is summoned to an urgent ophthalmic case. The aim of this article is to offer some guidance in these matters, and I shall group my remarks around three outstanding examples:—

- (1) An injury to the eye of a child.
- (2) A case of acute glaucoma.
- (3) The onset of sudden blindness in one eye.

AN INJURY TO THE EYE OF A CHILD.

In this connection there are two things the family practitioner ought never to forget: first, that the fate of an injured eye will depend upon its treatment during

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the twenty-four hours immediately following the accident; and, second, that the parents will expect the child to see after it recovers from the injury. In any other part of the body, if a wound heals soundly, the presence of a cicatrix is usually of little consequence; but there must be no scar if the functional integrity of the eye is to be preserved. The practitioner's responsibility is very great. He must, therefore, never allow himself to be infected by the atmosphere of nervousness in which he will be enveloped as soon as he enters the patient's house. When every one is excited and apprehensive it is absolutely necessary for the practitioner to keep cool and collected. He should be particularly careful to say as little as possible until he has completed his examination of the patient.

His first duty is to inquire fully into the history of the accident, because by that means he is likely to learn a great deal regarding its nature. A good clinical history is always a great help towards a correct diagnosis. For example, an injury will vary according to the character of the object with which the eye was struck—a stone, a fork, a knife, a pellet from a toy pistol, to name only a few of those most frequently responsible. While the history of the case is being taken the child should be laid on its back in a good light, and told to keep both eyes shut. If a few drops of 2 per cent. solution of cocaine be placed in the hollow at the inner canthus they will find their way into the conjunctival sac with every slight movement of the lids, and the eye will be anæsthetized by the time the doctor is ready to examine it. Cocaine will be of little use, however, if the child be very nervous and frightened, and in these circumstances a general anæsthetic will be required. It is very unsatisfactory to try to examine the eye while the child is screaming and struggling.

The skin should be inspected in the first instance and

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cases, however, the injury to the cornea is usually extensive and deep, consequently there is considerable danger that sight will be affected as a result of opacity or of irregular astigmatism of the cornea. Moreover, there is always a risk of sepsis, consequently it is prudent to keep the patient in bed. Rest is essential for the smooth healing of all injuries. In other parts of the body recourse is usually had to the support of a splint, and the same principle applies to injuries of the eye for which atropine is the physiological splint. It can be used in 1 per cent. solution and is usually instilled after the argyrol. The timely use of a mydriatic is the best preventive treatment of iritis, which is one of the most dangerous complications of this group of injuries. As a rule no further treatment will be necessary, but whenever the injury appears so severe that sight is likely to be damaged, the family doctor will be well advised to ask for a consultation with a specialist before any complications arise.

(2) *When the eyeball has been perforated.*—It is essential to obtain a good view of the eyeball. When the eye is properly seen the diagnosis is not difficult if attention be paid to the following signs: (a) The anterior chamber is empty; (b) the pupil is contracted and irregular in outline, and does not respond to the stimulus of light; (c) the iris is usually prolapsed through the wound in the cornea; (d) the lens may be wounded. It is important to take note both of the outline and of the general appearance of the pupil. A prolapse of the iris may be difficult to see and can easily be overlooked; but even although the actual prolapse may not be seen, it is a sure sign if the pupil has a pyriform shape. This special alteration in the outline of the pupil is due to the iris having been drawn into the lips of the wound of the cornea. If further examination shows that instead of being jet-black the pupil presents a grey reflex, the diagnosis of traumatic cataract can be made

the tension of the eye estimated by gentle palpation with the finger before making any attempt to separate the lids. If the tension be greatly reduced the eyeball has almost certainly been perforated, and it is well to be aware of that fact as soon as possible in the course of the examination. With antiseptic precautions the lids should be separated to get a good view of the eyeball. It is hardly necessary to say that all rough and awkward manipulations must be avoided, and if a retractor for the upper lid be not available, a serviceable substitute can be improvised by bending a hairpin. The conjunctival sac should carefully be explored. It is very unfortunate to overlook a foreign body in the retrotarsal fold or beneath the upper lid. Aided by a good light, the cornea must be examined for any abrasion of its surface. If nothing more than a superficial abrasion be discovered, all the treatment necessary is to instil a few drops of 10 per cent. to 20 per cent. solution of argyrol and to apply a compress and bandage. Argyrol is advised, not on account of its reputed antiseptic properties, but because its solution is so heavy that it finds its way into every part of the conjunctival sac and acts as a thorough scavenger. If septic infection of the abrasion be avoided, the epithelium of the cornea will be reproduced very rapidly and no scar will remain.

When the accident is more serious it is convenient to divide the cases into two groups—those in which there is no perforation, and those in which perforation has occurred.

(1) *When the eyeball has not been perforated.*—The chief signs to look for in making a diagnosis are as follows: (a) The anterior chamber is full; (b) the pupil is circular and responds to the stimulus of light; (c) the tension of the eyeball is normal. First aid must be given without delay. Instil argyrol and apply a compress and bandage. In this group of

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uninjured eye with the tragic result that sight may be lost in both eyes.

A CASE OF ACUTE GLAUCOMA.

No excuse is necessary for including acute glaucoma among the emergencies of general practice. In many instances it comes as a bolt from the blue. The patient—very often a woman about fifty years of age—goes to bed apparently in her usual health, but is awakened in the early hours of the morning by agonizing pain in the head accompanied by feverishness, nausea, persistent retching, and bilious vomiting. The symptoms are so alarming that the family practitioner is called in haste, and unless he knows well what he is about he may easily do more harm than good. When he arrives at the patient's bedside it is quite probable that no one will mention the eye; all attention has been concentrated on the general symptoms, so that even although failure in sight has been noticed it has been tacitly assumed to be due to biliousness. The true nature of the condition may very easily be overlooked, and if the practitioner be deceived the result will be deplorable. In such circumstances the possibility of acute glaucoma should always be kept in mind. It is not by any means a common disease, and a practitioner may be in practice for many years before he is called to a case. Nevertheless, every country practitioner ought to know about glaucoma, and be able to recognize the disease when he meets it. If he does not allow himself to be taken unawares there is not much difficulty in the diagnosis. The most important factor is to remember to examine the eye. It is when the practitioner omits to think about glaucoma that its presence escapes him.

The patient shrinks from the slightest touch, and may say that his eye feels too big for its socket. On palpation it feels hard as a stone. The bulbar con-

with confidence.

In these circumstances the eye is in grave danger, and the family practitioner, after rendering first aid, ought to rid himself of any further responsibility by transferring the case to a specialist at the earliest possible moment. The prognosis, however, will depend upon the first-aid treatment, which ought always to be as simple as possible. There should be no unnecessary handling of the eye, and copious douching, the use of strong antiseptics or of lotions containing lead must be avoided. A 10 per cent. solution of argyrol may be used freely, and if there be a prolapse of iris towards the centre of the cornea, 1 per cent. atropine should be instilled, but if the prolapse be at the periphery of the cornea, 1 per cent. eserine ought to be employed. The object of the treatment in both instances is to replace the iris into the anterior chamber by pulling it free from the lips of the wound in the cornea. A prolapse of iris is always a source of grave danger, but the family practitioner should never try to excise it. The operation is not so easy as it may appear, and to ensure success the operator requires to have considerable experience of ophthalmic surgery and also to possess suitable instruments. The skin of the eyelids and side of the face should be painted with a 1 per cent. tincture of iodine, a compress and bandage applied to the eye, and the patient put to bed to await the arrival of the specialist, or sent to him forthwith for further treatment. It is quite likely that the child's parents may express the wish to wait for a day or two before consulting a specialist, but the family practitioner ought not to approve of delay. Serious complications may occur very unexpectedly, and when they supervene the eye may be lost, even although the subsequent treatment has been directed by the highest skill. There is always danger ahead, because it is in perforating injuries that sympathetic inflammation is prone to attack the

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him examine the eye with great care. If he does so he will never confuse glaucoma with iritis.

After he has made a diagnosis the practitioner need not have much difficulty about the treatment. As a result of the increased intraocular pressure the patient is suffering agony and rapidly losing sight. The indications for treatment are to relieve pain and to contract the pupil. Morphia, our sheet anchor in so many emergencies, is invaluable in acute glaucoma. It should be given in full dose by hypodermic injection, and its sedative action can be assisted by fomentations and by leeching. It is also very important to get the bowels to move freely as soon as possible, and nothing is more effective than calomel followed by a saline draught. To contract the pupil and to reduce the tension of the eye the most convenient remedy is eserine 1 per cent. solution, repeated every two hours. The patient should be kept warm in bed and encouraged by the hope that the symptoms will be relieved after a sound sleep. Although it is wise to speak to the patient in a very reassuring manner, the practitioner, before he leaves the house, ought to tell the relatives that the condition of the eye is serious, and to warn them that on the following day an operation may be necessary. Sleep is Nature's cure for glaucoma, and if the patient has had a good night the eye will probably be much better when he awakens in the morning. If, at his morning visit, the practitioner finds the pain relieved and the pupil contracted he can safely continue the treatment; but if, on the contrary, he finds the general symptoms acute and the pupil dilated he should not hesitate to ask for a consultation with a specialist. He cannot accept responsibility for delay. The circulation of the intraocular fluids has become strangulated; and, if the increased pressure be not relieved promptly, serious impairment of sight, terminating in many instances in blindness, will inevitably

conjunctiva is congested and cedematous; the cornea is steamy and so insensitive that it can be touched without the patient's knowledge; the pupil is dilated, irregularly oval shaped and irresponsive to light; the anterior chamber is shallow and sight is seriously impaired.

At this stage of the examination the practitioner must be on his guard not to misinterpret the significance of these signs and symptoms. The hardness of the eye, the dilated pupil, the shallow anterior chamber, and the loss of sight ought to be sufficiently diagnostic to prevent acute glaucoma from being mistaken for any other disease. Unfortunately, however, the unwary frequently confuse glaucoma and iritis, with deplorable results. It is common knowledge that in iritis the vigorous use of atropine is imperative; but it is not so well known as it ought to be that if a mydriatic be instilled into an eye suffering from glaucoma the symptoms will be so gravely aggravated that the prospects of recovery are very materially lessened. Few errors in diagnosis and treatment are followed by such disastrous results. The subject is so important that repetition may be excused, and to sum up briefly let me say:—

(1) When the family practitioner is summoned to an urgent case, in circumstances such as have just been described, he ought always to bear glaucoma in mind, and be quite sure he has excluded that disease before he commits himself to any other diagnosis.

(2) Until it is certain that there is nothing wrong with the eye, the possibility of acute biliousness or migraine being the cause of the attack ought never to be considered.

(3) While retching and vomiting are usual accompaniments of acute glaucoma, these symptoms are so exceedingly rare in iritis that their presence should be sufficient to put the practitioner on his guard and make

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result. The hopelessness of the situation can, however, be removed by operation provided action be taken in time. The state of the eye in acute glaucoma has been compared to a strangulated hernia. The analogy is apt, and if it be remembered the family practitioner will never on his own responsibility counsel delay because he will readily understand that relief to strangulation is as imperative in the eye as it is in the bowel.

THE ONSET OF SUDDEN BLINDNESS IN ONE EYE.

The dread of blindness has been the predominating note in the description of the two ophthalmic emergencies which have just been considered, but in this third group the loss of sight is an accomplished fact before the practitioner sees the patient. Suddenly, and without warning, sight is wholly or completely lost. It is the sudden onset which distinguishes this group of cases from all others. A patient discovering by accident that he is blind in one eye promptly consults his family practitioner in the belief that the loss of vision is recent and sudden, whereas an examination of the eye reveals that the amblyopia is either congenital or the result of chronic disease of the optic nerve. It is obvious that these cases cannot be included in the present category. The patient we have in mind can either tell the exact time and mode of onset of the seizure, or will say that he noticed a blur before one eye on first waking in the morning. The frequency with which the loss of vision occurs during the night is one of its characteristic features, and brings the ocular phenomena into line with sudden seizures in the brain and other parts of the body. If the practitioner can use the ophthalmoscope he will very quickly arrive at a definite diagnosis of the pathological condition actually present in the fundus oculi. It is unfortunate that so many are content to leave the use of the ophthalmoscope to the ophthalmologist. An electric ophthalmo-

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scope, equally with a stethoscope and a clinical thermometer, ought to be part of the ordinary outfit of every general practitioner. A certain amount of training and experience in the use of the instrument is doubtless required, for it is necessary not only to be able to see with the ophthalmoscope, but also to be able to interpret what is seen. To have actually examined the fundus oculi for one's self is a great help in diagnosis, even although later on the lesions are more fully described and their significance explained by an expert. The fact that the family practitioner does not possess an ophthalmoscope ought not to prevent him from making a thoroughly satisfactory examination of the patient. He will gain all the information necessary for first-aid treatment by testing the field of vision. He requires no instruments, because an examination sufficient for clinical purposes can be made by the hand. The patient should stand facing the examiner with his back to the light, and at a distance of about two feet. Each eye must be examined separately, and while one is being tested the other should be carefully covered. The patient should look fixedly at the examiner's nose, while the latter, holding his hand mid-way between himself and the patient, moves his outstretched forefinger from the periphery towards the centre of the visual field. The patient is told to say whenever he sees the movement of the finger. Both the examiner and the patient should see the movement of the finger at the same moment, provided that in both the field of vision is normal. The movements of the hand are repeated in the different meridians of the field until it has all been explored. By this simple method the examiner compares the patient's field of vision with his own, and any differences in their extent are at once detected. This examination enables the doctor to discover whether the blindness of which the patient complains is complete or partial, and if partial whether

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round about him, but everything he looks at is a blank. At other times a black spot in the line of vision hides the object he wants to see. The presence or the absence of this black cloud is very important in differential diagnosis. If, for example, a patient on awakening from sleep discovers that he is seeing imperfectly with one eye, and complains of a black spot in the line of vision, a hæmorrhage has occurred in front of the macula, whereas if he simply cannot see what he looks at, no obstacle being visible in the line of vision, he is suffering in all probability from a localized inflammation of the optic nerve.

(3) *The Defect is in the Periphery of the Field of Vision, but Central Vision is Retained in Whole or in Part.*—In an emergency consultation the patient usually complains either of a blind side, right or left, or that he cannot see when he looks upwards or when he looks downwards. He suffers from hemianopsia, which may be either of cerebral or of retinal origin, and, although there are exceptions, it may be stated as a clinical axiom that, when the dividing line between the blind and the seeing portion of the retina is vertical, the hemianopsia is the result of hæmorrhage in the visual pathway on the opposite side of the brain, whereas when the dividing line is horizontal the cause is likely to be detachment of the retina or an obstruction in a large branch of the retinal circulation. It is hardly necessary to point out that in hemianopsia of cerebral origin both eyes are always affected.

The onset of migraine is sometimes heralded by a transient attack of hemianopsia, but its brief duration and the sequence of the symptoms are so characteristic that a practitioner is not likely to have any difficulty in arriving at a correct diagnosis.

the defect is in the centre or in the periphery of the field of vision. That knowledge enables him to classify his patients into three groups.

(1) *The Whole of the Field of Vision is Lost.*—The patient has suddenly become blind in one eye. That as a rule means that something has gone seriously wrong with its main blood supply. The most usual clinical manifestations are embolism of the central artery of the retina, thrombosis of the central vein, and profuse intraocular hæmorrhage. When confronted with such an emergency the family practitioner may at once remember that the patient had rheumatic fever in childhood, or that he is at present suffering from glycosuria, albuminuria, or high blood-pressure. That knowledge will enable the practitioner to understand the meaning of the association of symptoms, and to offer a satisfactory explanation of them to the patient. There is no necessity to be too pessimistic in the first instance, because, whether he can use the ophthalmoscope or not, the practitioner will be well advised to seek a consultation with an ophthalmologist, whose larger experience of the local conditions ought to be helpful in assessing the prognosis. The family practitioner should, if possible, be present at the consultation with the specialist, because, although the latter will be most helpful in diagnosis and prognosis, the position will be reversed when treatment is discussed. It is then that the family practitioner's intimate knowledge of his patient's medical history should be invaluable, consequently in the interest of the patient he ought never to dissociate himself from the treatment. The best results are most likely to be got when the specialist and the family doctor collaborate.

(2) *Central Vision is Lost, but Peripheral Vision is Preserved.*—The patient can see nothing straight in front of him; he is unable to read, to thread a needle, or to recognize the face of a friend. He can see objects

OPHTHALMIC EMERGENCIES

round about him, but everything he looks at is a blank. At other times a black spot in the line of vision hides the object he wants to see. The presence or the absence of this black cloud is very important in differential diagnosis. If, for example, a patient on awakening from sleep discovers that he is seeing imperfectly with one eye, and complains of a black spot in the line of vision, a hæmorrhage has occurred in front of the macula, whereas if he simply cannot see what he looks at, no obstacle being visible in the line of vision, he is suffering in all probability from a localized inflammation of the optic nerve.

(3) *The Defect is in the Periphery of the Field of Vision, but Central Vision is Retained in Whole or in Part.*—In an emergency consultation the patient usually complains either of a blind side, right or left, or that he cannot see when he looks upwards or when he looks downwards. He suffers from hemianopsia, which may be either of cerebral or of retinal origin, and, although there are exceptions, it may be stated as a clinical axiom that, when the dividing line between the blind and the seeing portion of the retina is vertical, the hemianopsia is the result of hæmorrhage in the visual pathway on the opposite side of the brain, whereas when the dividing line is horizontal the cause is likely to be detachment of the retina or an obstruction in a large branch of the retinal circulation. It is hardly necessary to point out that in hemianopsia of cerebral origin both eyes are always affected.

The onset of migraine is sometimes heralded by a transient attack of hemianopsia, but its brief duration and the sequence of the symptoms are so characteristic that a practitioner is not likely to have any difficulty in arriving at a correct diagnosis.

Fractures of the Patella and their Treatment.

By CECIL P. G. WAKELEY, F.R.C.S., F.R.S.E.

Assistant Surgeon, King's College Hospital and Belgrave Hospital for Children.

THE patella, which is the largest sesamoid bone in the body, being developed in the tendon of the quadriceps extensor muscle of the thigh, is quite commonly fractured. A fracture may be caused by direct or muscular violence, the latter being by far the more frequent cause. In fact, the patella is fractured by muscular violence more often than is any other bone in the body. When muscular violence is the cause the fracture is transverse, the upper fragment being, as a rule, the larger. Direct violence causes a comminution of the bone.

The patella consists mainly of cancellous bone overlaid with a thin covering of compact bone, which has a thick covering of hyaline articular cartilage on its posterior surface. It is dependent for its blood supply on the vessels which enter it from the quadriceps tendon, while a very few small branches may be traced to it from the ligamentum patellæ. This being so, it is quite easy to understand that the middle part of the patella has not such a good blood supply as its upper and lower borders. In infancy the patella is better supplied with blood than in the adult, for the bone starts to condryfy at the fourth month of foetal life, and does not ossify until the fourth year after birth. During this period it is situated in the tendon of the quadriceps extensor. After ossification has commenced the bone grows, and the anterior part of the quadriceps tendon becomes

thinned out and the tendon itself finds attachment to the upper part of the patella, only a relatively small amount of fibres extending over the front of the patella into the ligamentum patellæ. These fibres constitute part of the anterior portion of the capsule of the knee-joint.

The patella is usually fractured by muscular violence when the knee-joint is semi-flexed and the quadriceps tendon is suddenly thrown into contraction; the patella being poised on the lower end of the femur, a transverse fracture results. Slipping while descending a staircase or walking on the street paving is quite a common way in which such a fracture is caused. The line of solution of continuity is transverse and may be in the upper, middle, or lower part of the patella, depending on the amount of flexion of the knee-joint at the time of the injury. If the knee is only slightly flexed the line of fracture will be about the middle of the bone, while, on the other hand, if the knee is almost fully flexed the fracture will occur in the lower part of the bone.

The capsule and overlying periosteum are practically never torn at the same level as the fracture in the bone, but nearly always at a lower level. This fact is of great importance, as the upper fragment of the patella is pulled up by the action of the quadriceps extensor muscle, and if it is forced down by manual manipulation so as to bring it into contact with the lower fragment, the fibrous capsule and periosteum attached to the upper fragment become pushed in between the two bone fragments and will prevent osseous union. Furthermore, extravasation of blood always takes place from the torn capsule and gravitates between the fragments into the joint. It is due to the interposed fibrous tissues and blood clot that transverse fractures of the patella, unless operated upon, always heal by fibrous union; and this fibrous union always stretches until the two fragments may be separated to the extent

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A horseshoe-shaped flap is turned down, exposing the fractured ends of the bone, which are cleared of all clot and fibrous shreds. Tracks for the silver wire

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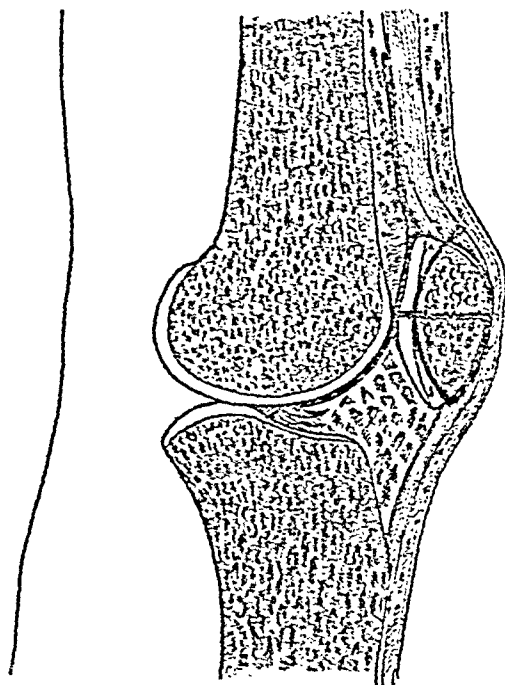


FIG. 2.—Lister's method of suturing the patella by open operation.

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Prior to the time of Lister, fibrous union was the usual result of these fractures because they were treated by fixing the limb to a splint, the two fragments being held in apposition by strapping. Heath was a strong advocate of applying plaster of Paris bandages as soon as possible after the fracture, and if the knee-joint was swollen he aspirated the joint before the application of the bandages.

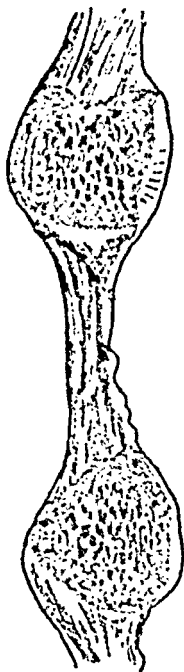


FIG. 1.—Fibrous union of fracture of patella. A specimen presented to King's College Hospital by Lord Lister.

Alderson described a specimen taken from a man who died of apoplexy, having broken his patella twenty-three years before. He had been treated with pads and adhesive strips of plaster, together with a gum and chalk bandage. The bond of union between the fragments was chiefly ligamentous, but in its centre there was a complete bridge of bone. In this case the bridge of bone was probably formed from the intumed portion of periosteum between the two fragments of bone.

Gem reported the case of a man, aged 60, in whom the fragments could not properly be brought together. On his death, three months after the accident, the knee-joint was found to contain three ounces of clotted blood, which pushed up the fragments and kept them completely apart.

In the pre-antiseptic era, fibrous union of the patella was so crippling a condition for a working man that excision of the knee-joint was sometimes performed to give the patient a stable leg.

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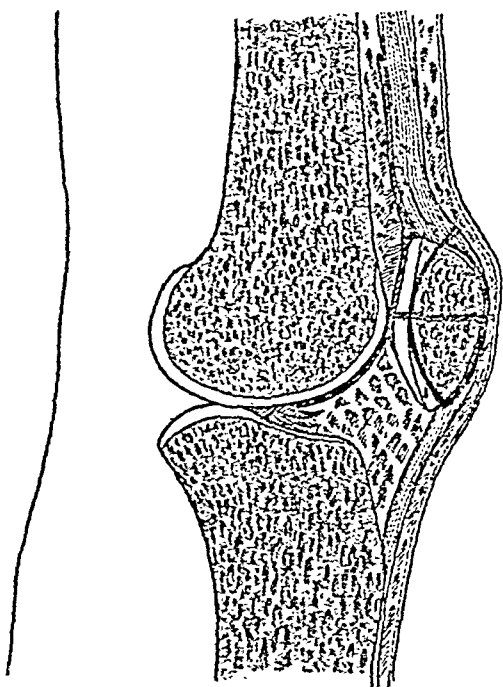


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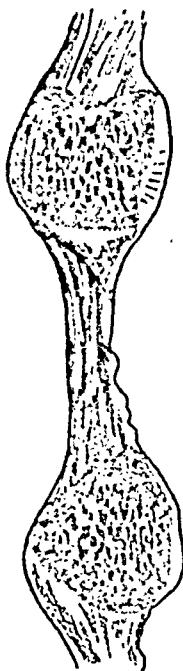


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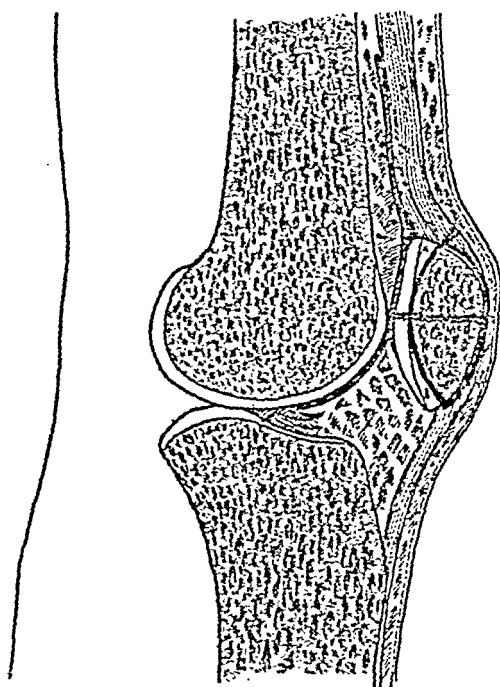


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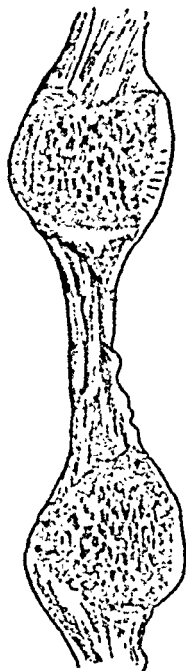


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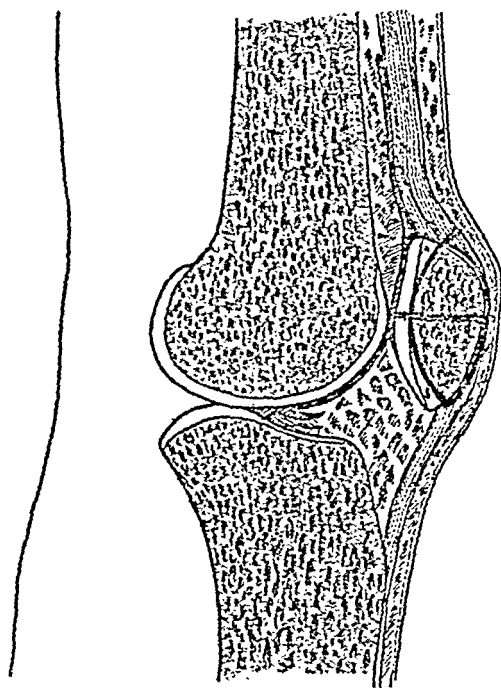


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extensor muscle are sutured by interrupted catgut sutures. The skin is closed with interrupted silkworm-gut sutures. A back splint is applied. Passive movements are commenced in ten days, and by the end of a fortnight the patient is allowed to walk.

In 1885, Lister read a paper before the Medical Society of London and made an urgent plea for the general adoption of the open operation. He exhibited six patients on whom he had operated with excellent results. There was a lengthy discussion following the paper, and the operation was considered dangerous and unjustifiable by such men as Bryant, Heath, Holmes, Gant, Marrant Baker, Morris, and Sydney Jones. About the same time Turner reported a case at the Clinical Society of London in which a man, aged 39, had had his left patella fractured in 1859. Early in 1881 he fell, and the already stretched fibrous union gave way to such an extent that the separation was over $2\frac{1}{2}$ in. An open operation was performed and the fragments wired together. Suppuration ensued and the knee became stiff. At this meeting a report of 50 cases of wiring the patella was submitted. Ankylosis resulted in eight cases and in three cases the issue was fatal.

The reason why the operation was so unsuccessful in surgeons' hands other than those of Lister was due to the lack of cleanliness in the operative technique. However, Lister's house surgeons acted as true disciples, gradually became scattered over England, and, practising his antiseptic technique, soon began to publish successful operations on fractured patellæ. At the same time surgeons from all over the world came to Lister operate, and returning to their native ^{six months} were fully carried out his operative technique way in spite of ^{consults}. the man made an un-

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FRACTURES OF THE PATELLA

its adoption as the routine treatment. Notwithstanding the very excellent results which were reported from all parts of the world, the leading London surgeons still condemned the operation.

Many years later Barker advocated a subcutaneous operation. This was devised to avoid the supposed

risks of laying open the joint. A piece of silver wire was inserted under the skin over the patella and then a large curved needle was passed behind the patella and withdrawn through the first hole in the skin. The silver wire was thus made to encircle the patella (Fig. 3). The wire was first tightened to bring the two fragments together and then twisted off and pushed under the skin. This method was unsatisfactory, as the

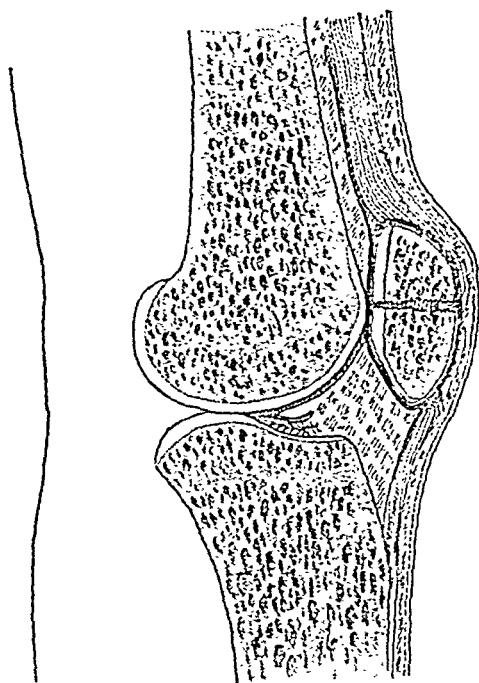


FIG. 3.—Barker's method of subcutaneous suture for fractured patella, showing the infolded torn capsule between the two fragments.

two fragments could not be brought into accurate apposition, while blood clot and tucked-in fibro-periosteal flaps always prevented osseous union. Quite a number of subcutaneous operations were devised, but Barker's was the only one which had any popularity.

At the present day open operation is the proper treatment, but silver wire is rarely employed. Of recent years there has been a considerable reaction

against the method of burying silver wire in the tissues, especially when passed through a bone exposed to tension or movement. The wire may become disintegrated and break, or rarefactive osteitis may be caused thereby. Surgeons at the present time are rather favouring methods which depend on absorbable ligatures in the form of unchromicized catgut.

A large flap is turned down over the joint, blood clot is removed from between the fractured fragments,

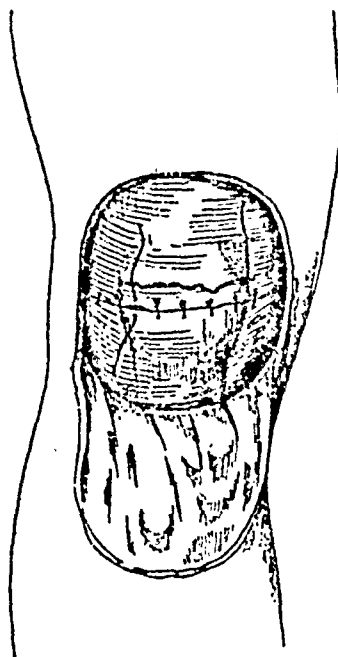


FIG. 4.—Open operation for transverse fracture of patella. The dotted lines demonstrate the line of fracture.

and the inturned fibro-periosteal flaps are withdrawn. These flaps are accurately sutured with interrupted catgut sutures (Fig. 4). Sometimes extra suturing in the form of antero-posterior cerclage of the bone with two or three strands of stout catgut is undertaken. The results of these operations fully justify their use. They are founded on an accurate knowledge of the pathology of the condition, for nothing short of an open operation can possibly remove blood clot and tags of inturned fibro-periosteum from between the two fragments of bone. Once this has been done, accurate suturing of the

fibro-periosteum and lateral tendinous expansions is all that is required. It may be wise to delay operation for a few days in order that the joint may recover from the immediate effects of the injury. The best form of splint to apply after the operation is a ham splint, as this allows five degrees of flexion at the knee-joint, which is the most comfortable position for the joint.

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It is important that the quadriceps extensor muscle should not be permitted to atrophy before the patient is allowed to walk; this can be prevented by giving massage to the muscle around the knee-joint while the leg is still on the splint.

Fractures of the patella due to direct violence are usually stellate or comminuted. These cases should be treated by open operation, and the toilet of the joint

should be similar to that described for a transverse fracture resulting from muscular violence. The method of suturing, however, is different. In order to ensure the correct apposition of the fragments a circular catgut suture is inserted in an interrupted fashion through the fibro-periosteum over the periphery of the patella (Fig. 5). The lacerated capsule and its lateral expansions are then united by several interrupted catgut sutures. This method is far superior to the insertion of silver wire through the substance of many small fragments of bone. The

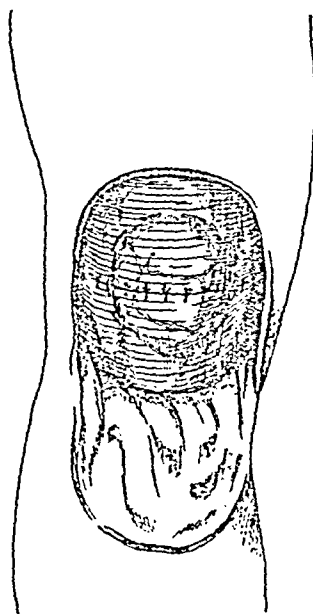


FIG. 5.—Open operation for comminuted fracture of the patella. The fracture is shown as dotted lines.

after-treatment should be somewhat more prolonged than in the case of a transverse fracture.

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The Mechano-Therapeutics of Acute and Chronic Synovitis of the Knee-joint.

By EDGAR CYRIAX, M.D.

IN this article in THE PRACTITIONER I have especially chosen the knee for discussion because it is the commonest joint in which acute and chronic synovitis may occur. What I shall say about these affections of the knee-joint can, however, equally well be applied to the same conditions in other joints of the body.¹

(A) ACUTE SYNOVITIS.

Nearly all practitioners condemn employment of any form of movement as a therapeutic measure for acute synovitis as being both irrational in theory and dangerous in practice. In their opinion nothing but harm will result in such cases unless strict rest be enforced until the acute stage has passed. This opinion is based upon the fact that both ordinary massage (i.e. petrissage and effleurage) and vibrations produced by machines, which have at times been tried for acute synovitis, have been found either to cause no improvement or to make matters worse, and that exercise such as standing, walking, etc., has also been found deleterious in these cases.

Although the foregoing movements ought not to be included in the therapeutics of acute synovitis, there are other forms of movement which can be used in this

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condition with the greatest advantage. These, based on the Swedish system of Per Henrik Ling, were elaborated by the late Henrik Kellgren (1837-1916) and have been employed by various practitioners ever since. The fact that they have not received the recognition they deserve by the profession at large is chiefly due to the fact that a practical knowledge of the methods can only be gained by long experience demanding much patience and much time.

The movements (according to the methods of Henrik Kellgren) which I employ in the treatment of acute synovitis are as follows:—

- (1) Manual vibrations.
- (2) Passive movements of the joint.
- (3) Active (resisted) movements of the joint.
- (4) Frictions on the nerves of the affected limb.

(1) *Manual Vibrations*.—I have described their technique on several previous occasions in medical literature,² and shall therefore content myself with a brief summary. The joints of the finger, wrist and elbow are kept as loose as possible compatible with the correct execution of the movement. The finger-tips are to remain in contact with the part of the body to be treated, and must not leave it during the application of the vibration. A rapid alternating contraction and relaxation of some of the muscles of the forearm, in whole or in part, is then set up. The amount of muscular force should be minimized; with gentle vibrations the contraction of the muscles of the forearm should be only just perceptible to the sense of touch. The result of this vibration is that the part under treatment will be subjected to a series of fine, rapid, wave-like movements of alternating application and removal of pressure.

During the actual application of the vibrations, the experienced operator can tell whether stronger or

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SYNOVITIS OF THE KNEE-JOINT

in the latter can only occur when the exudation is enabled to pass through the actual membrane itself.

Now, it is well known that continued pressure *per se* may do something to promote absorption of a joint effusion by forcing it through the synovial fluid into the lymphatics. Vibrations act in a similar manner but much more efficaciously. Their superiority lies in the fact that the alternate compressions and relaxations in the knee-joint which they produce cause the effusion to be expressed through the synovial membrane by successive microscopical drops. Therefore the lymphatics are much better enabled to deal with them, as they can absorb each such drop and send it onwards before dealing with the next one.

From the clinical point of view, a single vibration treatment applied to a case of acute synovitis of the knee can in almost every case be seen to cause an immediate obvious diminution in the swelling of the joint, together with marked decrease of pain; so much so that the patient, previously unable to move his joint at all, finds himself capable of performing complete active extension of the joint without discomfort.

(2) *Passive Movements of the Joint.*—There is one very important point in the technique of application of passive movements of joints (and also of resisted ones, *vide infra*) which has not received due recognition and adoption. It is that, wherever possible, resort should be had to the simultaneous use of "traction." By this is meant that the operator grasps the proximal and distal ends respectively of the bones between which the joint lies, and elongates the latter by drawing the former in opposite directions, and keeps up this elongation (traction) during the whole time that he executes the passive movements of flexion and extension, etc., of the joint. By the use of this traction the opposing

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smaller amounts of pressure, greater or less excursion of movement, etc., are necessary, and modify his treatment accordingly. Concerning the length of time at each sitting during which these vibrations are to be applied, it may be taken that, as a rule, about fifteen minutes are necessary in which to produce the maximum beneficial effect. Longer periods can prove deleterious just as shorter ones may be less efficacious.

Vibrations applied as above have a great penetrative effect and therefore can reach every portion of the knee-joint, which, of course, ordinary petrissage cannot do. It is an easy matter to test this penetrative power; if one hand be placed below the knee-joint during the application of vibrations on its anterior aspect, they can be felt to pass through it and are almost as intense as if the operator's hand were being touched instead. Similarly one can feel vibrations applied to the frontal region passing through to the occiput, and to the back of the chest when they are being administered on its anterior surface.

The effect of these vibrations is as follows:—

- (a) Promotion of absorption of the effusion.
- (b) Promotion of the circulation of the lymph in the affected area.
- (c) Promotion of the venous return in the affected area.

I must here refer to certain points in connection with the anatomy of lymphatics. Ludwig and Schweigger-Seidel³ found that the lymphatics in the tendons, fasciæ and aponeuroses are respectively arranged in two sets, superficial and deep, and that the least application and removal of pressure or elongation and shortening causes a flow of lymph from the deep into the superficial set and thence onwards into the larger lymphatic vessels. Tillmanns,⁴ Braun,⁵ Kroh⁶ and others have shown that there are no stomata in the synovial membrane, and that absorption of effusions

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in the latter can only occur when the exudation is enabled to pass through the actual membrane itself.

Now, it is well known that continued pressure *per se* may do something to promote absorption of a joint effusion by forcing it through the synovial fluid into the lymphatics. Vibrations act in a similar manner but much more efficaciously. Their superiority lies in the fact that the alternate compressions and relaxations in the knee-joint which they produce cause the effusion to be expressed through the synovial membrane by successive microscopical drops. Therefore the lymphatics are much better enabled to deal with them, as they can absorb each such drop and send it onwards before dealing with the next one.

From the clinical point of view, a single vibration treatment applied to a case of acute synovitis of the knee can in almost every case be seen to cause an immediate obvious diminution in the swelling of the joint, together with marked decrease of pain; so much so that the patient, previously unable to move his joint at all, finds himself capable of performing complete active extension of the joint without discomfort.

(2) *Passive Movements of the Joint.*—There is one very important point in the technique of application of passive movements of joints (and also of resisted ones, *vide infra*) which has not received due recognition and adoption. It is that, wherever possible, resort should be had to the simultaneous use of "traction." By this is meant that the operator grasps the proximal and distal ends respectively of the bones between which the joint lies, and elongates the latter by drawing the former in opposite directions, and keeps up this elongation (traction) during the whole time that he executes the passive movements of flexion and extension, etc., of the joint. By the use of this traction the opposing

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articular surfaces of the joint are separated and the intra-articular tension diminished.⁸ Thus pain is reduced or abolished during the performance of passive movements applied with such traction.

When applying passive movements to a case of acute synovitis they should at first be administered through a very small radius and gradually increased in range and speed, always taking care to cause no pain. It is surprising how this procedure will facilitate the subsequent performance of active movements.

Generally speaking, the effects of these passive movements are analogous to those induced by manual vibrations (which are in reality a series of very fine, rapid, passive movements of joints), but, of course, are more intense than the latter.

(3) *Active (Resisted) Movements of the Joint.*—In acute synovitis it is often very difficult or impossible to perform active movements, because the muscular action entailed by them approximates the articular surfaces of the joint and produces an intolerable increase in the already augmented intra-articular pressure. But when traction is applied as above and maintained during the movement, the intra-articular tension is kept continually diminished and the contracting muscles are prevented from approximating the opposing articular surfaces. Thereby resisted movements can, in most cases, be quite well performed, although the corresponding active ones cannot be done. Indeed, it is often found that there is less pain or discomfort when performing these resisted movements with traction than when the affected limb is being kept at rest.

Resisted movements are of great importance in the treatment of acute synovitis; they prevent the formation of adhesions, tend to remove them when already formed, improve the circulation, and prevent the

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atrophy of muscles which so readily and rapidly arises in all such acute joint affections.

(4) *Frictions on the Nerve of the Affected Limb.*—I have described the technique of "nerve frictions" on several previous occasions,⁹ and so shall merely give a brief summary of the method: The part of the body in which lies the nerve that is to be treated is placed in such a position that the muscles, fasciæ, etc., lying superficial to it are relaxed. The operator places one or more digits to one side of the nerve in question and moves it or them across the nerve at right angles to its long axis, a slight amount of pressure being applied at the same time. It must here be insisted upon that it is of the utmost importance that the skin of the patient and the manipulating digit should move over the nerve as one, as otherwise a scratch of the skin results, the nerve itself being left uninfluenced. As soon as the nerve has been traversed, the pressure is released; then, either a friction is applied in the reverse direction, thus arriving at the original position, or the digit is passed lightly back to the latter and the manipulation repeated in the same direction. Each individual friction occupies about a quarter of a second.

Frictions should be applied to the nerves of the thigh leading to the knee-joint and to the corresponding posterior branches of the spinal nerves from whose anterior branches the nerves of the thigh are derived.

The effect of these nerve frictions is to stimulate the entire nervous supply of the joint and its surrounding muscles and to promote the central nervous mechanism of repair of diseased tissues.

What I have just described represents the routine treatment by movement of acute synovitis of the knee and other joints. It is also applicable to many cases

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of arthritis, such as are due to gonorrhoea or to those arising during attacks of rheumatic fever. The only modification necessary is that in both cases no pain whatever should be caused by the manipulations; this, as a rule, necessitates reducing the intensity with which vibrations are to be administered and frequently having to apply all passive movements very carefully through a very small range, or even eliminating them altogether. It is surprising, however, what an analgesic effect vibrations will have in these cases and thus facilitate the early application of passive movements.

I may mention that I am not alone in recommending passive manipulations for rheumatic fever.¹⁰

(B) CHRONIC SYNOVITIS.

The treatment by movements for chronic synovitis is very similar to that for acute synovitis, but applied much more energetically, and with the addition of petrissage, which is of great value.

Concerning petrissage, I must state that I invariably use the dry form, taking care that my fingers do not glide over the skin, but that my fingers and skin move as one over the underlying structures. The latter has a penetrative effect, crushing thickenings, etc., whereas petrissage with lubricants has but a superficial one and is of very little use in chronic synovitis. To apply effleurage in these cases is, in my opinion, mere waste of time.

Almost all writers on the subject appear to consider that the patient should have his knee extended during the application of petrissage. I consider, however, that it is often much better to have it flexed to a right angle, as in this position many portions of the knee-joint can be influenced much more directly than when the extended position of the joint is assumed.

During the last thirty years I have treated a very large number of cases of acute and chronic synovitis

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of the knee-joint and other joints in the manner described, and have never had reason to regret it. Especially in the acute cases have the results nearly always been very rapid—I have often had a *restitutio ad integrum*, with permanent results, in a week or less. I therefore beg to be allowed to recommend the methods described to the profession at large.

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¹ For previous writings by the author on acute synovitis, see *Arch. Gén. de Kinésithér. et de Physiother.*, 1911, xiii, 17-22, reprinted in "Collected Papers on Mechano-Therapeutics," 1924, 266-270.

² "Elements of Kellgren's Manual Treatment," 1903, *New York Med. Journ.*, 1911, xciii, 978-983; *Med. Press and Circ.*, 1915, N.S., xcix, 291-294; *Clin. Journ.*, 1924, liii, 259-264.

³ "Die Lymphgefäße der Fascien und Sehnen," 1873.

⁴ *Arch. f. Mikroskop. Anat.*, 1876, xii, 649-664.

⁵ *Deutsch. Zeit. f. Chir.*, 1894, xxiv.

⁶ *Ibid.*, 1908, xlv.

⁷ See the author, *Med. Press and Circ.*, 1918, N.S., cv, 370-372, and "Collected Papers," 1924, 276-280.

⁸ Haycraft (Schäfer's "Text-book of Physiology," 1900, p. 235) states that an elongating force of 500 grams applied to a metacarpophalangeal joint is sufficient to cause separation of the bones and the parts over the joint to sink in, due to the inter-articular tension becoming less than the atmospheric pressure. Reyher (*Deutsch. Zeit. f. Chir.*, 1874, 26-89) stated that a weight of 12 lb. applied to the knee-joint separated the opposing articular surfaces from 1 to 3½ mm.

⁹ "Elements of Kellgren's Manual Treatment," 1903, 142 *et seq.*; *New York Med. Journ.*, 1910, xcii, 171-175; cvi, 1023-1025; 1917, cvi, 105-106; *Edin. Med. Journ.*, 1913, N.S., xi, 504-515; *Internat. Clin.*, 1912, S. xxii, i, 41-57; *Brit. Journ. Child. Dis.*, 1914, xi, 155-167; *Zeit. f. Phys. u. Diät. Ther.*, 1914, xviii, 75-80; *Med. Press and Circ.*, 1918, N.S., cvi, 421-424; 1923, N.S., cxv, 296-297, cxvi, 359-363; *Glasgow Med. Journ.*, 1919, N.S., ix, 193-203.

¹⁰ Kouindjy, *Rev. de cin.*, 1904, vi, 198-206; Möller, *Svensk. Gymn. i In-ö Utland.*, 1907, iii, 467-469; Sarafidi, *Rev. de thérap. méd-chir.*, 1902, lxxviii, 73-79, and *Comm. II Congr. internat. Physiothér.*, 1907; de Munter, *Zeit. f. Phys. u. Diät. Ther.*, 1913, xvii, 724-731.

The Injection Treatment of Varicose Veins.

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THIS article in *THE PRACTITIONER* is founded upon a lecture and clinical demonstration given before the Balham Medical Society, and I should like to put on record my appreciation of their invitation.

There is no operation the passing of which will be less regretted than the surgical excision of varicose veins. The operation was tedious, disfiguring and by no means safe, each of the many points of ligature being of necessity the site of a thrombus. Embolus after surgical excision was not at all uncommon. Embolus after the injection of a sclerosing solution into veins is exceedingly rare. I know of only one case in Europe and three in the United States, although the method has been applied many thousands of times. In three of these four cases dangerous factors were allowed to enter which we should today exclude. It is equally pleasant to speak of the efficiency of the injection method if it be properly executed. I have so far never met anyone with experience of the injection of varicose veins who doubted its efficiency. Of the patients themselves, 80 per cent. volunteer expressions of satisfaction and not 2 per cent. are dissatisfied with the result.

The history of the method dates from 1904, when Tavel first employed it at Berne. Its actual development is a practical routine we owe to the French and in particular to Sicard of Paris, while in this country it has been popularized by Alexander and Douthwaite.

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My own knowledge of the subject has largely been gained while working with Mr. Rodney Maingot, to whom I am indebted for stimulating tuition, and the technique I shall describe in this article is the same as that practised in his clinic at the Royal Waterloo Hospital.

Let us now consider shortly the physiology and mechanics of the varicose venous system. This is usually centred around the internal saphenous vein. In the normal person blood flows from the ankle up the vein, entering the deep femoral vein at the upper part of the thigh. Now, in those with varicose veins this is not the case. On the contrary, it has been shown that when they are standing or sitting down blood flows along the internal saphenous vein from the thigh to the ankle, then through the capillaries, in the direction reverse to normal and so to the deep veins. Up towards the heart it goes in the deep veins and along the deep femoral vein past the opening into this of the internal saphenous vein. No blood is entering the deep femoral vein from the internal saphenous. Instead, blood will leave the deep femoral vein to descend the internal saphenous and pass again through the capillaries, so completing the vicious cycle. Seeing, then, that the skin of the lower extremity will be supplied with blood that infrequently returns to the heart to be reoxygenated, we should expect the skin to be poorly nourished and liable to dermatitis and callous ulceration. We can break the vicious cycle by putting out of action the superficial varicose veins, and this is best done by chemical obliteration produced by the injection of certain solutions.

Now, what is this chemical obliteration and how does it progress? I shall first say what it is not, by giving two examples. If you introduce a foreign body into a saturated solution of urea in a beaker, you will see crystals appearing in the centre of the solution and soon.

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large portions of the solution will be solid. In the same way, when a vein has bacteria loosed into it by the bursting of an adjacent abscess, a blood clot is formed in the centre of the stream, and carried along with the disastrous result of embolism. The chemical obliteration at which we aim is a very different thing from this. I would compare it with the furring of a boiler in which no anti-scaling composition has been used and in consequence the inner surface presents fine irregularities. Such irregularities appear on the endothelial lining of the varicose vein after the introduction of the chemical irritant. As the result of their presence fibrin is deposited upon and around them, gradually narrowing the central channel until at length it is obliterated. So systematic is this deposition that the result is a fine fibrous clot resisting separation from the wall in a manner comparable to the tenacity with which fur resists scaling from a boiler. These facts are demonstrated by excising and examining veins at varying periods after injection. We can now understand why pulmonary embolus after injection is rare, while after surgical excision its incidence is greater than one in a thousand cases. Let us now deal with the solutions used to obliterate veins. The technique and chemicals employed vary with different workers. No one method is exclusively the best. It is essential to master some good method and use it consistently. By this means the operator gains confidence and a mental observation post from which he can survey and assess as far as he is able the teaching of others.

Many operators use one solution only and claim equally good results; thus Sicard uses sodium salicylate and Douthwaite quinine. Between these two solutions I do not think there is much to choose. In my own practice I use four solutions:—

(a) Sodium salicylate in strengths of 20, 30, 40 and 50 per cent., to which is added tutocaine $\frac{1}{2}$ per cent.

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(b) Quinine hydrochloride (B.P.), grams 4; urethane, grams 2; distilled water, c.cm. 30.

(c) The injection of solutions (a) and (b) at the same sitting in different parts of the same vein. This is referred to in the rest of this paper as the twin solutions.

(d) Sodium chloride, 20 per cent., to which is added tutocaine $\frac{1}{2}$ per cent.

In order to decide the solution I will use on the particular patient, I adopt the following classification of varicose veins for which I am indebted to Mr. Rodney Maingot:—

Type 1. Patient young, skin good, veins good, and in the line of the internal saphenous vein. No ulcer and no eczema.

Type 2. Any age patient, skin good, vein tortuous and out of the saphenous line.

Type 3. Old people, skin very thin, veins bulging and history of thrombosis of the superficial veins.

Type 4. Ulcers present.

Let us take Type 1 first. I start with an injection of 1 c.cm. of 20 per cent. sodium salicylate at the distal part of the limb. A week later I re-examine. If the injection has taken, I put in three injections, each of 2 c.cm. of 20 per cent. sodium salicylate, into different parts of the varicose veins. This is continued weekly until all are obliterated. Should the treatment at any time fail to obliterate the injected vein I substitute for the sodium salicylate the quinine solution, and if this fail I use the twin solutions. These latter I have never known to fail.

In Type 2 I start with 30 per cent. sodium salicylate and continue as before, using as a first alternative quinine, and as a second the twin solutions.

In Type 3 I start with quinine and use as a first alternative the twin solutions.

Type 4 is dealt with as follows: Clean up the ulcer with fomentations and eusol dressings. The associated

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veins are injected with quinine starting 6 inches from the ulcer. After each injection an Unna's plaster is applied.

A method recently introduced by Mr. Rodney Maingot at the Royal Waterloo Hospital consists in injecting the base of the ulcer from three or four peripheral points, using quinine urethane and following up with an Unna's plaster. This method is still in the experimental stage. However, several patients with ulcers of many years' standing have been cured by this means.

I have still to explain the use to which I put the solution of sodium chloride 20 per cent. and tutocaine $\frac{1}{2}$ per cent. It is employed for any vein whose wall is so thin as to allow percolation of the solution through it and consequent ulcer. It is also used in the smaller veins around the ankle and on the foot, in which sites an ulcer or tender spot is undesirable because of the pressure of the boot.

As general rules I suggest the following:—

(1) Ascertain whether a patient has any idiosyncrasy to a drug by limiting the first injection of quinine to $\frac{1}{2}$ c.cm. or of sodium salicylate to 1 c.cm.

(2) Never give more than 3 c.cm. into one point at a time or more than 6 c.cm. in all at a sitting.

(3) Where the twin solutions are used one may give 4 c.cm. of each.

(4) Inject at weekly intervals.

Quinine must not be used in pregnancy, nor at or about the menstrual period. Injection treatment has no place in the presence of advanced renal cardiac or pulmonary disease. Locally there are three contraindications:—

(1) Acute septic thrombophlebitis.

(2) Deep thrombosis of the leg. This may be suspected when there is a history of acute white leg of pregnancy, typhoid fever, diabetes or syphilis, or when

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one leg is larger than the other, or if there is constant oedema. Deep thrombosis is essentially secondary in onset; it first appears at or after middle life, and is rarely familial.

(3) When the veins take the form of multiple small telangiectases. Fortunately this type is not disabling and its only handicap a cosmetic one.

OPERATIVE PROCEDURE.

A 5 c.cm. record syringe is used, previously sterilized by methylated spirit and washed through with sterile water. The needle used is a No. 16 fine hypodermic needle. Finer needles than this can be obtained up to No. 20, but offer too great obstruction to the passage of the solution. The solutions are prepared on the day of injection, and their sterility must be guaranteed. I have tried ampoule preparations from many makers, but do not like them, as a large proportion are found on use to be discoloured. If crystals have appeared in the quinine solution the bottle should be placed in warm water until the solution is clear.

The position of the patient depends upon the type of veins present. In most cases he sits on a stool with the feet touching the floor. If the veins are small and difficult to locate he stands upon a chair with someone at his side. If the veins are very large he lies down on a couch, which admits the solution to a greater intimacy with the vein wall, although the vein still remains visible. To secure the patient's confidence by a good start it is advisable to choose an easy vein for the first injection. Before injecting, the affected area is cleaned up with spirit, after which 3 c.cm. of the solution to be used is drawn into the syringe. Wipe the needle and syringe with a clean swab to dry the outer surface. Holding the syringe with the plunger end higher than the needle the latter is inserted through good skin 1 cm. from the vein and pushed on obliquely into the vein.

As the needle passes through the vein wall there will be momentary resistance and then the point is inside. The plunger may now be withdrawn with obvious ease and the blood pours into the syringe. When the sequence has occurred you may inject your solution slowly. But if it has not occurred, or if you do not feel the needle enter the vein, or if blood comes back into the syringe in drops, and not in a good stream, or if you are not satisfied beyond all possible doubt that you are in the vein, then withdraw your needle altogether, and turn your attention for that day to other parts of the leg. I cannot too strongly emphasize this point. Unless your solution is in the vein—all in the vein, and none outside the vein—you will get an ulcer. Such ulcers are painful, take months to heal, and discredit the operator and the method. We all get them at times, although I am happy to say I have had only one recently. In that case I took the precautions detailed before

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commencing to inject. All appeared well. After injecting 1 c.cm. I again withdrew the plunger. This time blood entered the syringe in drops and not in a good stream. I withdrew the syringe at once and noted what had occurred. A week later, as I feared, there was a small ulcer. The lesson is obvious; not only must the precaution of withdrawing the plunger be taken before starting the injection, but it must be repeated once or twice during the injection.

On completing the injection withdraw the needle, elevate the limb, and press the puncture with a swab until any bleeding has stopped. It is a help to stop bleeding if the skin be put on the stretch. Next wipe the skin dry and then seal with a strip of adhesive plaster. If one puts plaster on skin still wet with spirit an area of erythema results, which lasts ten days. The patient is encouraged to walk immediately after the injection, and then continues the usual daily routine. Some operators routinely use a tourniquet. I find an Esmarch rubber tourniquet of assistance in 10 per cent. of the cases. Whether the patients stand, sit or lie down it is a simple matter to take a few turns of the Esmarch tourniquet around the thigh, letting it go after introducing the needle and before injecting. It is an aid to locating the vein, but does not affect the quality of the result.

The reactions after an injection may be normal or abnormal, and it is well to explain them to the patient before commencing treatment. I will deal first with the normal reactions. On inserting the needle there is a momentary prick. Pain during the injection indicates that the needle is not in the vein, but this most serious error would be avoided if the method detailed earlier in this article is followed. A minute after the injection the vein may swell. On first walking after the injection a cramp-like pain may be felt running distally in the limb. The patient should be reassured. This pain has little significance. It is infrequent when tutocaine is employed. On the following day the injection site may ache and be tender. This often persists for a week, but rarely prevents running, dancing or tennis. One is told commonly there is pain in the limb when the patient coughs or gets up in the morning. It lasts for several minutes, and is observed within the first ten days after injection. It is usually seen after the successful injection of a large bunch of veins, being uncommon with those of moderate

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size. A transient œdema may last a day or two. In some patients linear bruising along the injected vein occurs. It clears up in three or four weeks. In others a pink blush occurs over the injected vein. It subsides within a fortnight, when further injections at the site may be resumed. On the day following an injection the vein at the point of the injection will be hard and thrombosed. The extent of thrombosis varies from one to six inches, depending upon the solution and the particular patient's response. Within a week the limb is appreciably smaller in size and its contour more normal. Later the veins are represented by fibrous cords. These latter will disappear within three months in the case of small veins and in muscular sites such as the calf. In the larger veins and over bony prominences they may last two or three months longer.

Abnormal reactions may be general or local. Of the former a feeling of faintness is not uncommon, but is due to apprehension rather than to the drug. Quinism is avoided by testing the patient with a small injection and noting the occurrence of flushes, buzzing, the taste of the drug, or of hypogastric pain. Of abnormal local reactions two are possible: they are sepsis and ulcer. Their prevention is essential. This can, and must, be ensured—sepsis by rigid surgical asepsis, and ulcer by adhering to the rules detailed in this article.

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Dark irides do not react to ephedrine so well as light irides, and 2 per cent. solution may be needed for the former where 1 per cent. is sufficient for the latter.

It is not a cycloplegiac, and even when fully dilated the pupils react slightly to light and on accommodation. Mydriasis passes off in about one hour. When accommodation is exercised the mydriatic effect passes off more quickly.

No blanching of the conjunctiva follows instillation, and no rise of tension results in the normal eye. In fifty glaucomatous eyes in which mydriasis was produced by instillation of 2 per cent. solution, no rise of tension was recorded, and in twelve cases a slight fall was noted. The measurements were made with a Schiotz tonometer under holocaine anaesthesia. Ephedrine will produce mydriasis in the glaucomatous eye which is under the influence of eserine, and is in turn overcome by the instillation of pilocarpine 1 per cent., or eserine, grain $\frac{1}{8}$ to 1 ounce. Miosis results in five to ten minutes.

It is inferior to homatropine and cocaine in that it is not a cycloplegiac, but has the advantage that its influence passes off rapidly and no rise of tension is produced. Cocaine damages the corneal epithelium, but ephedrine does not. When instilled as a 1 per cent. or 2 per cent. solution it produces no discomfort, although instillation of 5 per cent. solution has produced toxic results.²

Although the number of glaucomatous eyes examined with the drug is small, the results so far suggest that it can be used to examine the fundi in these cases without evil after-effects. It appears to be the most suitable drug for ophthalmoscopic examinations in routine practice.

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Ephedrine in Ophthalmology.

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*Assistant Surgeon, Wolverhampton and Midland Counties Eye
Infirmary, etc.*

THE plant ma huang, a species of ephedra, has been in use in China for medical purposes for about 5,000 years. In 1887 Nagai extracted from the plant the alkaloid ephedrine.¹ Its action is similar to that of adrenaline, but it is slower in action and more prolonged in effect. It stimulates the nerve endings of the sympathetic system. Ephedrine is a cardiac depressant, but when injected intravenously or intra-muscularly it causes vaso-constriction with resulting rise of blood-pressure for a considerable period. It can be sterilized by boiling without any alteration of the substance, and does not deteriorate by being kept for long periods.

In strengths of 1 per cent. to 10 per cent. ephedrine is a mydriatic, but we have used it only in 1 per cent. and 2 per cent. solutions. Mydriasis is complete in fifteen to thirty minutes. The effect of the drug varies according to age, state of congestion of the eye, the presence of synechiæ, and the amount of pigment. Dilatation is not so complete after middle age as it is before it. Where the conjunctiva or uvea are congested the dilatation is incomplete, but if combined with 1 per cent. atropine in cases of iritis the action of the atropine is very much improved, and mydriasis results in many cases where atropine alone has failed; this action is well marked in post-operative iritis. In chronic iritis it will often break down recent synechiæ where atropine alone has been tried without success.

THE PRACTITIONER

Dark irides do not react to ephedrine so well as light irides, and 2 per cent. solution may be needed for the former where 1 per cent. is sufficient for the latter.

It is not a cycloplegiac, and even when fully dilated the pupils react slightly to light and on accommodation. Mydriasis passes off in about one hour. When accommodation is exercised the mydriatic effect passes off more quickly.

No blanching of the conjunctiva follows instillation, and no rise of tension results in the normal eye. In fifty glaucomatous eyes in which mydriasis was produced by instillation of 2 per cent. solution, no rise of tension was recorded, and in twelve cases a slight fall was noted. The measurements were made with a Schiotz tonometer under holocaine anæsthesia. Ephedrine will produce mydriasis in the glaucomatous eye which is under the influence of eserine, and is in turn overcome by the instillation of pilocarpine 1 per cent., or eserine, grain $\frac{1}{8}$ to 1 ounce. Miosis results in five to ten minutes.

It is inferior to homatropine and cocaine in that it is not a cycloplegiac, but has the advantage that its influence passes off rapidly and no rise of tension is produced. Cocaine damages the corneal epithelium, but ephedrine does not. When instilled as a 1 per cent. or 2 per cent. solution it produces no discomfort, although instillation of 5 per cent. solution has produced toxic results.²

Although the number of glaucomatous eyes examined with the drug is small, the results so far suggest that it can be used to examine the fundi in these cases without evil after-effects. It appears to be the most suitable drug for ophthalmoscopic examinations in routine practice.

References.

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Ephedrine in Ophthalmology.

By H. CAMPBELL ORR, M.B., CH.B.

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Practical Notes.

The Treatment of Pernicious Anæmia.

S. Davidson has made an investigation into the etiology, the bacteriology, the measurement of red blood corpuscles before and after liver therapy, the phenomenon of reticulation, the effect of hydrochloric acid on the gastro-intestinal flora, an animal test for the potency of liver extracts, and the treatment of cases of pernicious anæmia with liver and liver extracts. Sixty-seven cases have been treated, and the claims made by Minot and Murphy have been fully substantiated. The author insists that the indiscriminate use of liver in the treatment of all manner of ailments by the laity and by the medical profession cannot too strongly be denounced. Before prescribing liver therapy it is essential that an accurate diagnosis be made, for it is only in pernicious anæmia that satisfactory results can regularly be expected. In secondary anæmia, improved blood regeneration takes place to a much smaller degree in about one-third of the cases treated. Accordingly, when faced with a case of unknown anæmia it is essential that a careful examination of all the formed elements of the blood should be made. From this it should be possible to say whether the case is one of primary or secondary anæmia. If the latter, a careful hunt for the causal condition should be undertaken. Failure to do this has already resulted in cases of cancer and tuberculosis being missed until too late for proper treatment. Apart from these reasons, the indiscriminate use of liver has placed on the poorer classes an economic burden which they can ill afford to support. Every week patients tell Dr. Davidson that not only has the price of liver risen greatly but that they are unable to obtain it in sufficient and regular quantities. The time has come, in the author's opinion, when public authorities should pass a law by which pernicious anæmia patients should have the first call on liver for sale in the butchers' shops.—(*Edinburgh Medical Journal*, February, 1929, p. 10 [Supplement].)

The Treatment of Neurasthenia.

R. Benon is of opinion that physico-therapy is not of much value in the treatment of true neurasthenia; neither hydrotherapy, electricity, nor heliotherapy have been found of benefit, in his experience. In neurasthenic dyspeptics bicarbonate of soda is contra-indicated, and magnesium oxide, with bismuth, is to be preferred; in some cases, dilute hydrochloric acid is of great benefit, given before meals, in water. Constipation should be combated by mild laxatives, such as psyllium seeds or liquid paraffin. The glycerophosphates are among the best drugs to employ in the treatment of neurasthenia, and the following prescription may be found useful:—

R.				
Magnes. glycerophos.	-	-	-	cg. 25 (grs. iv.)
Pulv. valeriani.	-	-	-	cg. 10 (grs. j.ss.)
Pulv. belladonn.	-	-	-	mg. 5 (grs. $\frac{1}{12}$)

Sig.: For one cachet; to be taken twice daily before meals.

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Strychnine should never be given to true neurasthenics; and opotherapy is of little benefit, except that extract of the suprarenal is helpful to patients who are very depressed; it is best given in the form of the fresh gland, powdered, in capsules.—(*Journal des Praticiens*, February 9, 1929, p. 89.)

The Uses of Luminal in General Practice.

W. Blumenthal describes many disorders met with in general practice in which luminal may be administered. He finds that the sodium salt is a valuable drug in the treatment of intractable vomiting in such conditions as acute gastritis, food poisoning, uræmia and the vomiting of pregnancy. The luminal is given in the form of a suppository to which extr. belladonnæ. or extr. opii may be added if necessary for the relief of pain, the dosage being as follows:—

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Sodium luminal. - - - g. 0·2-0·3 (grs. iij.-ivss.)
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The drug takes effect within fifteen to twenty minutes, when the patient becomes sleepy and apathetic and the vomiting ceases. Dr. Blumenthal has found luminal especially useful in cases of food poisoning or of gastro-intestinal catarrh in which as a result of incessant vomiting the patient has become dehydrated. In these cases, as soon as the patient begins to get sleepy after administration of the suppository, it is possible to give appreciable quantities by mouth of the urgently needed fluid without causing further vomiting. —(*Medizinische Klinik*, January 18, 1929, p. 111.)

The Treatment of Gall-Bladder Disease.

J. B. Deaver observes that what it is best to do with the chronically diseased gall-bladder depends chiefly on the clinical evidence. He personally believes that, other things being equal, the chronic gall-bladder cannot be removed too early, for the following reasons: First, medical treatment, which includes all forms other than operative, cannot eradicate the pathology of the chronic gall-bladder, nor can it restore disordered function, such as the power of absorption and excretion, concentration of bile, or the contractile power, since it cannot remove the pathology responsible for the impaired or lost function. If medical treatment cannot remove the pathology, it is powerless to prevent extension of the pathology, and extended pathology in most instances means embarrassment of the pancreas and subsequent disease of this organ, which, if far advanced, complicates otherwise simple surgery. The chronically infected gall-bladder likewise exposes the liver, the intra- and extra-hepatic ducts, the heart and the kidneys to serious damage, while the embarrassment of adjacent organs by crippling pericholecystic adhesions is a familiar sight. Furthermore, the chronic gall-bladder, if not recognized and operated on early, favours the formation of stones, which, in many instances, migrate to the common duct, causing obstruction of the duct with disastrous

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The Treatment of Rickets by Quartz Lamp Therapy.

H. J. Gerstenberger and J. I. Hartman, as a result of observations in thirteen rachitic and spasmophilic infants, find that weekly exposures to the ultra-violet rays produced by the quartz lamp in doses of one erythema unit to both front and back, bring about healing in practically the same time required by the heavier schedules at present generally used. The number of exposures is reduced to one a week; and it is not practical to expose in infants a limited part of the body surface. Because of the simplicity and economy of this arrangement, and because of the slight change that is produced by such exposures to the skin, the adoption of this schedule as a routine procedure in the case and prevention of rickets and rachitic spasmophilia by the employment of the ultra-violet rays is recommended by the authors. As a result of the use of the quartz lamp schedule followed, no increase in spasmophilic symptoms and no lengthening of the time period, at the end of which the cathodal opening contraction level was greater than five, were observed in rachitic infants manifesting spasmophilic symptoms.—(*Journal of the American Medical Association*, February 2, 1929, p. 367.)

The Medical Treatment of Exophthalmic Goitre.

A. Zimmer and W. Fehlow record their treatment of forty cases of exophthalmic goitre by intramuscular injections of defibrinated blood. Nine slight cases and fourteen severe ones were undoubtedly benefited by the treatment, the standard of improvement being the reduction in the pulse-rate, and in the basal metabolic rate and the amount of increase of body weight. Sixteen other cases were still under observation, whilst one case with advanced myocardial degeneration had died. Two injections were usually given, the first, of 3 to 5 cm. of defibrinated sheep's blood, the second, given eight to ten days afterwards, of the same quantity of ox blood. If it were thought desirable to give another injection, this was given after an interval of four weeks. Slight anaphylactic symptoms of headache fever occur and occasionally a transient albuminuria may follow the injection. If the reaction is accompanied by a very high fever the second injection is postponed for a fortnight or longer. After a slight initial loss in body weight due to the fever, the patient rapidly begins to put on weight and the pulse-rate becomes slower. No dangerous complications have been seen to follow this method of treatment. Drs. Zimmer and Fehlow do not advise any concomitant administration of drugs with this method except when the heart is much decompensated. Then if the anaphylactic fever reaches a high level cardiac stimulants may be given with advantage.—(*Münchener Medizinische Wochenschrift*, January 25, 1929, p. 146.)

An Operation for the Cure of Tic Douloureux.

W. E. Dandy publishes the details of an operation for the cure of tic douloureux by partial section of the sensory root of the

PRACTICAL NOTES

trigeminal nerve at the pons. The sensory root is reached through a bloodless path beneath the cerebellum, by a somewhat crescent-shaped incision made in the occipital region on the affected side, beginning near the midline and extending in a transverse direction just below the origin of the trapezius muscle, and turning laterally in a straight line to the tip of the mastoid. An area of bone, about 4 cm. by 4 cm., is removed, and extensions of this opening made towards the cisterna magna and towards the mastoid; the dura is incised in stellate fashion, the cisterna magna opened, and the cerebellar hemisphere elevated; the thin covering of the cisterna lateralis is then opened between the auditory nerve and the tentorium, and between the auditory nerve and the petrosal vein a spatula is introduced, giving a full view of the sensory root of the trigeminal nerve throughout its course from the tentorium to the pons. Section of the nerve at the pons is usually bloodless. At first, Dr. Dandy performed total division of the sensory root, but gradually it has been found that by partial section of the root the pain is cured and at the same time the sensation to the entire domain of the fifth nerve is but little disturbed.—(*Archives of Surgery*, February, 1929, p. 687.)

The Intranasal Application of Insulin.

H. Wassermeyer and A. Schäfer have observed the effect on the blood-sugar in diabetics and in normal controls of insufflation of the nasal mucous membrane with a powder containing borax as a vehicle and varying quantities of insulin. Each powder of 25 to 30 mg. contained from 10 to 30 units of insulin. This powder was found to be quite non-irritant. Both in normal controls and in the diabetic cases a marked fall in blood-sugar took place within $2\frac{1}{2}$ hours of the insufflation, thus proving that absorption from the mucous membrane of insulin had occurred. Drs. Wassermeyer and Schäfer do not suggest that this form of administration of insulin can replace that of subcutaneous injection in severe cases of diabetes which call for constant supervision, but they think that it may have a useful application in the treatment of the milder ambulant forms of the disease in which patients are at present allowed to give themselves the injections. The substitution of an intranasal administration for the often painful needle prick would be welcomed by these patients, and suitable dosages could, with care, be readily determined.—(*Klinische Wochenschrift*, January 29, 1929, p. 210.)

Gastric Ulcer in a Newborn Infant.

M. Schwaab and M. Lebourlier report an interesting case of gastric ulcer in a newborn infant. The child was born by Cæsarean section, performed twenty-four hours after the commencement of labour. It began to vomit on the second day, and on the third and fourth days the vomit was blood-stained. In spite of treatment the infant rapidly declined, and died on the sixth day. A post-mortem examination showed a distended stomach, and the small intestine full of blood; on opening the stomach an ulcer, about the size of a sixpence, was found at the junction of the superior and

consequences.—(*New England Journal of Medicine*, January 24, 1929, p. 159.)

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two control cases developed severe reactions.—(*Medical Journal and Record* [New York], February 6, 1929, p. 136.)

The Prevention of Tuberculosis.

P. Nelis insists on the value, in the prophylaxis of tuberculosis, of the vaccination of infants by the B.C.G. vaccine (*vaccin bilité de Calmette et Guérin*). He is of opinion that this constitutes a new and powerful weapon against tuberculosis. It has been shown that the vaccine is, in any case, absolutely harmless, and experiments with it on animals susceptible to tuberculosis have failed to give rise to any tuberculous lesions. In a total of 4,854 infants who were not vaccinated with this vaccine, born in 1925, 1926 and 1927, the public health authorities and the dispensaries have treated 1,989 born of tuberculous mothers and 2,865 born in tuberculous families; of the former, the mortality from tuberculosis has been 18 per cent., and the general mortality 24 per cent.; of the latter (born and brought up in tuberculous families) the mortality from tuberculosis has been 13.9 per cent., and the general mortality 18 per cent. On the other hand, during the same years 2,368 infants were treated with B.C.G. vaccine, 879 born of tuberculous mothers and 1,489 born in tuberculous families; of the former the mortality from tuberculosis has been 3.8 per cent., and the general mortality 16 per cent.; of the latter (born in tuberculous families) the mortality from tuberculosis has been 2.6 per cent., and the general mortality 8.9 per cent. These figures would seem to bear out the opinion of the author on the value of prophylactic treatment with B.C.G. vaccine.—(*Bruxelles-Médical*, January 20, 1929, p. 335.)

The Treatment of Dupuytren's Contraction.

A. B. Kanavel, S. L. Koch and M. L. Mason publish an important study of Dupuytren's contraction, with a description of the palmar fascia, a review of the literature and a report of 29 surgically treated cases. The results obtained have impressed upon the authors the importance of wide excision, not only of the contracted fascia, but of all its attachments to the skin, the interfascial septa, the volar interosseous fascia, the metacarpal bones and the phalanges. Although in such an operation apparently normal fascia may be removed, this is not considered a disadvantage, but rather an added guarantee against recurrence. Careful dissection and elevation of the skin is necessary to avoid trauma and subsequent necrosis. Skin which is hopelessly involved should be excised and replaced by a free full thickness graft rather than attempt to bring together wound edges under tension. In long-standing cases with marked contraction of the fingers, excision of the head of the proximal phalanx and shortening of the extensor tendon of the affected fingers should be carried out through a dorsal incision. Active movement of the fingers and hand should be made as soon as the operative wound is soundly healed. If treated in such a manner complete restoration of function may reasonably be hoped for, although cellular infiltration of the hand and partial anaesthesia and stiffness of the fingers may persist for a considerable period of time after the operation.—(*Surgery, Gynecology and Obstetrics*, February, 1929, p. 145.)

THE PRACTITIONER

middle-thirds of the lesser curvature of the stomach; there were no other ulcerations, and no ecchymoses, while the other organs of the body were healthy. The Wassermann reactions of the parents were negative, and no infection or disease was present in the mother.—(*Bulletin de la Société d'obstétrique et de gynécologie*, December, 1928, p. 923.)

The Treatment of Cancer of the Œsophagus.

V. E. Negus describes a technique (illustrated) for the application of radium in the treatment of cancer of the œsophagus, using a thread as a guide. Gastrostomy having been performed four months previously, an œsophagoscope was passed under local anæsthesia, and the carcinomatous stricture was dilated with Jackson's bougie to 8 mm. A fortnight later 100 mg. of radium was passed down to the growth in a special container attached to a railroad bougie; this was repeated on the two succeeding days, and on the sixth, seventh, eighth, thirteenth and fourteenth days of the next month. On the fifteenth the growth was again easily dilated to 8 mm., and on the nineteenth, twentieth and twenty-first 50 mg. of radium was applied just distal to the growth for two hours; on the twenty-second, twenty-third and twenty-fourth 50 mg. was applied just proximal to the growth for two hours. At the end of the course the patient could swallow light solids, while previously he had not been able to swallow even liquids for over five months.—(*Proceedings of the Royal Society of Medicine*, February, 1929, p. 527.)

The Treatment of Chronic Gonorrhœa.

A. Loeser has followed up many cases of chronic gonorrhœa in women who have been treated with small subcutaneous injections of live cultures of gonococci. He has found that the majority of cases after a period of two to five years has elapsed may be regarded as permanently cured. In Dr. Loeser's opinion the success of the method depends entirely on the age of the culture used, a young, active culture being essential for good results.—(*Medizinische Klinik*, January 18, 1929, p. 106.)

The Treatment of Lumbar Puncture Headache.

T. J. Heldt observes that one of the most frequent of the attendant after-effects of lumbar puncture is the headache, unmistakably characterized by its disappearance when the patient lies down and its reappearance when he arises. It may develop promptly after lumbar puncture or some hours or even one to three days after, and usually subsides within a week. In the author's opinion, spinal fluid leakage from the hole in the dura following lumbar puncture is an important causal factor, with resultant meningeal irritation and tension, as well as concentration and osmotic changes in the fluid remaining in the subdural system. By inserting into the puncture hole a small piece of anhydrated catgut, of diameter very slightly less than the bore of the needle used, Dr. Heldt has been able apparently to seal the hole in the dura; fifteen punctures with use of catgut were not followed in a single instance by headache, while

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two control cases developed severe reactions.—(*Medical Journal and Record* [New York], February 6, 1929, p. 136.)

The Prevention of Tuberculosis.

P. Nelis insists on the value, in the prophylaxis of tuberculosis, of the vaccination of infants by the B.C.G. vaccine (*vaccin bilté de Calmette et Guérin*). He is of opinion that this constitutes a new and powerful weapon against tuberculosis. It has been shown that the vaccine is, in any case, absolutely harmless, and experiments with it on animals susceptible to tuberculosis have failed to give rise to any tuberculous lesions. In a total of 4,854 infants who were not vaccinated with this vaccine, born in 1925, 1926 and 1927, the public health authorities and the dispensaries have treated 1,989 born of tuberculous mothers and 2,865 born in tuberculous families; of the former, the mortality from tuberculosis has been 18 per cent., and the general mortality 24 per cent.; of the latter (born and brought up in tuberculous families) the mortality from tuberculosis has been 13.9 per cent., and the general mortality 18 per cent. On the other hand, during the same years 2,308 infants were treated with B.C.G. vaccine, 879 born of tuberculous mothers and 1,489 born in tuberculous families; of the former the mortality from tuberculosis has been 3.8 per cent., and the general mortality 16 per cent.; of the latter (born in tuberculous families) the mortality from tuberculosis has been 2.6 per cent., and the general mortality 8.9 per cent. These figures would seem to bear out the opinion of the author on the value of prophylactic treatment with B.C.G. vaccine.—(*Bruxelles-Médical*, January 20, 1929, p. 335.)

The Treatment of Dupuytren's Contraction.

A. B. Kanavel, S. L. Koch and M. L. Mason publish an important study of Dupuytren's contraction, with a description of the palmar fascia, a review of the literature and a report of 29 surgically treated cases. The results obtained have impressed upon the authors the importance of wide excision, not only of the contracted fascia, but of all its attachments to the skin, the interfascial septa, the volar interosseous fascia, the metacarpal bones and the phalanges. Although in such an operation apparently normal fascia may be removed, this is not considered a disadvantage, but rather an added guarantee against recurrence. Careful dissection and elevation of the skin is necessary to avoid trauma and subsequent necrosis. Skin which is hopelessly involved should be excised and replaced by a free full thickness graft rather than attempt to bring together wound edges under tension. In long-standing cases with marked contraction of the fingers, excision of the head of the proximal phalanx and shortening of the extensor tendon of the affected fingers should be carried out through a dorsal incision. Active movement of the fingers and hand should be made as soon as the operative wound is soundly healed. If treated in such a manner complete restoration of function may reasonably be hoped for, although cellular infiltration of the hand and partial anaesthesia and stiffness of the fingers may persist for a considerable period of time after the operation.—(*Surgery, Gynecology and Obstetrics*, February, 1929, p. 145.)

Reviews of Books.

The Dermatergoses or Occupational Affections of the Skin. By R. PROSSER WHITE, M.D., M.R.C.S. Pp. 734. Illustrations: 12 plates, including 58 figures. London: H. K. Lewis & Co., Ltd. 35s. net.

THE recent and growing interest in industrial medicine, the ever-widening of the field of occupational dermatoses, and the publication two years ago of the monumental work in three volumes, "*Die Schädigungen der Haut durch Beruf und gewerbliche Arbeit*," by Ullmann, Oppenheim and Rille (1926), have made necessary the issue of a third edition of Dr. Prosser White's well-known book on the subject. This new edition is larger than its predecessor by over 300 pages, and the illustrations, which are so important a feature, are more than double. Further causes of dermatitis are described, and new trades incriminated. The introductory chapter on the history and nomenclature has been rewritten and extended to include a section on sensitization. Among the new material added is a description of mule-spinners' cancer, and the dangers of contact with low-grade oils, and among the new occupations associated with dermatitis is cited the incidental eruption which may follow contact with carpieces in wireless sets or telephones. A long and valuable list of references is appended, and a comprehensive general index of 200 pages. A hackneyed, though not undeserved, criticism of dermatology is that its nomenclature is overmuch encrusted and complicated by a redundancy of dog-Latin adjectives, a defect which modern writers on the subject are struggling to eliminate. It is all the more unfortunate, then, to find in the title of this new edition an excursion into dog-Greek like "*Dermatergoses*," which can lay no claim to either necessity or euphony.

Dental Medicine. By F. W. BRODERICK, L.R.C.P., M.R.C.S., L.D.S. Pp. 364. London: Wm. Heinemann, Ltd. 21s. net.

THE author of this book has for years made a study of the general reactions of the body and of the ductless glands in diseased dental conditions, and this work is the full survey of a number of articles which he has previously published. He believes that he is presenting a fuller knowledge of the pathology of dental caries and of pyorrhœa through a study of the disturbed metabolism of the body. There is an account of recent discoveries regarding acidosis and alkalosis, and of calcium metabolism, and a review of the part played by the ductless glands. The author goes on to develop the thesis that dental caries and pyorrhœa alveolaris are due to altered states of the body fluids. He accepts the view of Miller that the exciting cause of dental caries is the fermentation of carbohydrate foodstuffs by bacterial action, but he seeks to explain the puzzling problems of immunity and susceptibility to caries by attributing it to the

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production of a condition of acidosis in the body, a high hydrogen ion concentration of the saliva resulting in a passage of lime salts from the tooth substance into the saliva. On the contrary, in this view pyorrhœa is associated with a general alkalosis of the body, so that, in the author's opinion, it is an opposite and antagonistic condition to dental caries. A change in the direction of an acidosis produces dental caries directly. In the case of pyorrhœa, although there is a diminution in the hydrogen ion concentration, this is believed to only act indirectly in the production of the condition. In addition to the increased alkalinity of the saliva, there will exist a tendency to the deposition of sub-gingival calculus around the necks of the teeth, as a result of an attempt at the compensation of the alkalosis. We doubt whether the full argument as to the etiology of dental caries, and particularly pyorrhœa, can be substantiated, but any practitioner who wishes to freshen his mind by a stimulating study of many of the newer problems of bio-chemistry and of endocrinology will find them well put forth in this book. It may be studied to advantage whether one agrees with the author's conclusions or not.

Recent Advances in Neurology. By W. RUSSELL BRAIN, M.A., D.M., M.R.C.P., and E. B. STRAUSS, B.A., B.M., B.Ch., M.R.C.P. Pp. xii and 412. 38 illustrations. London: J. and A. Churchill. 12s. 6d. net.

THERE is no branch of medical science in which more progress has been made during the past twenty years than in neurology, and the field covered by this volume is of necessity a large one. Neurology is so intimately related to the anatomy and physiology of the nervous system that much outside clinical neurology has to be included. The chapter devoted to the conditioned reflexes is an admirable summary of Pavlov's work, while that on the cerebro-spinal fluid is a necessary preliminary to those on intracranial tumours and hydrocephalus which follow. From the clinical point of view the most interesting sections are those which deal with epidemic encephalitis, so far-reaching in its effects, and those which discuss therapeutics in diseases of the nervous system. The subject of epidemic encephalitis in all its aspects is well reviewed, and the description of its protean manifestations in the acute stage is particularly clear. The section on therapeutics does, as the authors suggest in the preface, remove the sting from the criticism that the neurologist can diagnose but not treat. The treatment of general paralysis by malarial inoculation is rightly given pride of place, and the indications for, mode of inoculation, course of the fever, its termination and the accessory treatment are described in detail. There is also a valuable section on the care of the paraplegic patient, which gives many practical points in treatment. Although some of the more theoretical considerations will appeal chiefly to those engaged in the study and practice of neurology, the volume should, nevertheless, be appreciated by all practitioners, to whom previous volumes in this series have proved acceptable. It is a worthy successor to them.

Preparations, Inventions, Etc.

COW AND GATE MILK FOOD PREPARATIONS.

(Guildford : West Surrey Central Dairy Co., Ltd.)

We have received samples of a number of milk food preparations manufactured by the makers of the well-known Cow and Gate Milk Food. "Export Cow and Gate Milk Food" is of particular interest to practitioners in India and the tropics, where the milk supply is always a problem. Not only is "roller process" dried milk of value in the nutrition of infants, but its value has been recognized in adults convalescing from enteric fever and malaria. "Lacquin" is a preparation of Cow and Gate dried milk blended with quinine, a breakfast cup containing 2½ grains of quinine. "Lacidac" is a preparation of Cow and Gate dried milk to which lactic acid B.P. has been added in accordance with Marriott's formula. This preparation should be beneficial in the treatment of gastro-enteritis and other digestive disturbances, especially in infancy. "Haemolac" has been prepared by the addition of iron ammonium citrate B.P. to a standardized milk and then dried by the roller process; it should prove valuable in the treatment of infantile anæmia. "Brestol" consists of highly emulsified fats (50 per cent.) and sugars—mainly dextrose (40 per cent.), flavoured with fresh orange juice. It is recommended in cases where it is necessary to substitute dairy cream or ordinary cod-liver oil emulsion, especially in marasmus and other wasting diseases.

A NEW SUSPENSORY BANDAGE.

(London : Messrs. John Bell and Croyden, 50, Wigmore St., W.1.)

Dr. A. Gardner (R.M.S. *Empress of Scotland*) writes:—In the treatment of gonorrhœa in the male I have found the following suspensory bandage much appreciated by patients. The bandage differs from the ordinary suspensory bandage in having a separate pouch for the penis in addition to the usual support for the testicles. This pouch is suspended from the pubic attachment of the bandage and is provided with an adequate elastic-bound opening at the root of the penis whereby the latter can be withdrawn for the purpose of micturition or changing of dressings. The advantages of the bandage are:—(1) Micturition and re-dressing can be performed by the patient without his having to undo any tapes and with no more exposure of the parts than would be required in normal circumstances; (2) dressings are held securely in position day and night and can be changed without risk of soiling the fingers; (3) the support given to the penis adds to the patient's comfort in the acute stage and may help to prevent the development of epididymitis.

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MAY

1929

The Treatment of Pulmonary Tuberculosis.

By F. G. CHANDLER, M.A., M.D., F.R.C.P.

*Physician with Charge of Out-patients, Charing Cross Hospital ;
Physician, City of London Hospital for Diseases of the Heart and
Lungs, Victoria Park, etc.*

THE treatment of pulmonary tuberculosis will depend in some measure on the type and extent of the disease. If, when the patient first comes for advice, there is widespread involvement of one lung with evidence of activity, either with or without cavity formation, then some special treatment will probably be indicated. This is true also in such cases as uncontrollable hæmorrhage and a rapidly spreading tuberculous bronchopneumonia. The special treatment I refer to is chiefly artificial pneumothorax, the marvellous efficacy of which never ceases to astonish me. This will be discussed later.

If the disease is early and proved by the discovery of tubercle bacilli in the sputum or in the fæces, strict treatment on sanatorium lines should at once be instituted and the patient must be warned at the outset that treatment, though not necessarily at a sanatorium all the time, will be necessary for at least a year. Many

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careless and cannot be bothered by
actions, and, unfortunately for the rest of

THE sometimes he is lucky and Nature heals the
with no co-operation, and during the healing
period he is a danger to others. Another is that at the
word "tuberculosis" he flies into a panic, and, finding
that the doctors will not guarantee a cure and do not
boast a certain specific which will cure him surely,
permanently and speedily, he flies off to some quack
who readily gives such a guarantee, and, again unfor-
tunately for the rest of mankind and for the cause of
truth, Nature will sometimes assert herself and cure
the disease, and the quack or charlatan gets the
credit.

Another reaction is a kind of reflex. At the word
"tuberculosis," the word "Switzerland" flies to the
mind. One has to explain that patients will do better
lying in an East End hospital than walking about among
the most beautiful mountains of Europe. Switzerland is
beautiful, sunshine may be enjoyed when there is but
little in this country, the so-called diaphaneity of the
air is greater and the beauty of the scenery may prove a
great mental stimulus, but I am convinced that there is
no special magic about Switzerland and that patients
can be completely and permanently cured by proper
treatment in England.

(1) *Rest*.—Of all treatment, rest is the most im-
portant. If there is fever, rest in bed should be
prescribed until the temperature has been practically
normal for three weeks. If there is much fever,
patients must rest absolutely, neither feeding nor
washing themselves. As the temperature falls, first
feeding and then washing are allowed and then the use
of the lavatory. When the temperature has become

will not submit to
to advise it. Failure
of this time period. We
yield to the appeals of the pain
and domestic difficulties, but nothing
for it only means more loss of time from work
a recrudescence of the disease and a worse prognosis.
If the patient's work is not suitable it is better
consider changing it from the outset. This, however,
is a counsel of perfection which frequently cannot
will not be followed.

If the symptoms are so suggestive that a diagnosis
of tuberculosis cannot be dismissed yet tubercle bacilli
are not found in the sputum or faeces, the X-ray
picture is negative, and there is not that complete
conjunction of cardinal symptoms that is almost proof
positive of tuberculosis, even without finding tubercle
bacilli, then, in my opinion, the advice to take a long
holiday with rest, fresh air and good food is probably
sufficient.

When, according to the criteria already mentioned, we
recommend sanatorium treatment, we may expect one
of several reactions on the part of the patient. If he is
endowed with that rare possession, common sense, he
will probably accept the view held by all experts, that
the greatest of all remedies are rest and fresh air, and
that the knowledge how to use these to the best advantage
can only be obtained under expert supervision.
Unfortunately, however, a great many *medical* men do
not appreciate the paramount importance of rest nor
what actually is meant by it. Others will say that
nothing on earth will induce them to go to a sanatorium
—they would be so affected by the sight of sick people,
they would be afraid of catching the disease worse. We
have to explain that they will meet there many who are
far fitter than themselves, that any danger of a sort of
super-infection is a myth, and that at a well-appointed,

PULMONARY TUBERCULOSIS

back and faking their temperature, and if the mental atmosphere of the place is one of seething discontent, introspective valetudinarian conversation, and malicious gossip. I am not suggesting that these practices are invariable or that they are confined to the sanatoria of any particular country; but that they do occur I know, and the ignorance and folly of the patients who act in this manner pass all comprehension. Many sanatoria will not take patients while they are febrile. This is for two reasons. The first that by so doing they protect themselves from the very advanced case which is, as a rule, quite unsuitable for sanatorium regime (though it is only too painfully evident that institutions for such cases are urgently needed). The second is a domestic reason. Febrile patients need more nursing and more attention. With the introduction of recent methods of treatment, however, it is obvious that a fully-equipped sanatorium will welcome many febrile cases and will be willing to admit, temporarily, advanced cases in the hope that they may prove unilateral and amenable to special treatment. This is one of the great advantages of a sanatorium. The patient can be watched for long periods under ideal conditions. The progress can be observed and the need for special treatment decided upon and advised at the right moment. Another advantage is that patients are taught how to live, how to use fresh air, how to rest and how to exercise. If a sanatorium cannot do all these things and does not teach all these things, it is failing in its duty and is a bad sanatorium.

(5) *Medicinal Treatment.*—So far as we know, there is no medicine given by mouth or spray or inhalation or injection into the wind-pipe that has any specific action against the tubercle bacillus. Of the supposedly specific remedies I will speak later. Nevertheless, there are many substances which have a reputation for doing

perfectly normal, it must be impressed on the patient that it is rest and not exercise that is needed. Very gradually increasing exercise on the level, carefully controlling it by the temperature chart, is allowed; no violent exertion is advisable for two or three years.

(2) *Sunshine*.—Sunshine, though used so successfully in the cure of bone and joint tuberculosis, has been looked at a little askance in pulmonary tuberculosis. For all that, I believe that it is of great value; but it must be employed with great caution and the technique advocated by Rollier at Leysin must be followed. The first part to be irradiated should be the feet and legs. The affected part must very gradually be approached and cautiously exposed. The head must be protected and the sunbath must end as it began—by exposure to the feet. The exposures must be carefully controlled by the temperature chart and the pulse rate.

(3) *Climatic Treatment*.—The criteria of a suitable climate should be freedom from damp and bleak winds, a dry subsoil, freedom from dust and crowds of people, the maximum of sunshine, hill rather than valley. But I would emphasize again that it is the life lived rather than the place in which it is lived that is the more important. The advantages of high altitudes in the mountains are the long weeks and months of unbroken, unfiltered sunshine, the clear, pure, bracing air and the inspiring scenery. That all these are good is, of course, obvious, but I would again stress this—that if the right kind of life be not lived then there is little advantage.

(4) *Institutional Treatment*.—In my opinion, the sanatorium is or should be the ideal place for the treatment of the tuberculous patient. It must be fully equipped, however, and the discipline must be good. All advantages are lost if patients with evening temperatures are dancing and drinking cocktails, and instead of taking their prescribed amount of exercise are strolling to the nearest bar and drinking, coming

back and faking their temperature, and if the mental atmosphere of the place is one of seething discontent, introspective valetudinarian conversation, and malicious gossip. I am not suggesting that these practices are invariable or that they are confined to the sanatoria of any particular country; but that they do occur I know, and the ignorance and folly of the patients who act in this manner pass all comprehension. Many sanatoria will not take patients while they are febrile. This is for two reasons. The first that by so doing they protect themselves from the very advanced case which is, as a rule, quite unsuitable for sanatorium regime (though it is only too painfully evident that institutions for such cases are urgently needed). The second is a domestic reason. Febrile patients need more nursing and more attention. With the introduction of recent methods of treatment, however, it is obvious that a fully-equipped sanatorium will welcome many febrile cases and will be willing to admit, temporarily, advanced cases in the hope that they may prove unilateral and amenable to special treatment. This is one of the great advantages of a sanatorium. The patient can be watched for long periods under ideal conditions. The progress can be observed and the need for special treatment decided upon and advised at the right moment. Another advantage is that patients are taught how to live, how to use fresh air, how to rest and how to exercise. If a sanatorium cannot do all these things and does not teach all these things, it is failing in its duty and is a bad sanatorium.

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good, and it is of immense psychological importance to have at our command many remedies in a long protracted illness.

One of the oldest that is still used, having survived the vicissitudes of many centuries, is tar. Dioscorides, surgeon to Nero, strongly recommended its use in phthisis, and creosote is prescribed daily at the present time. It is given in enormous doses at Victoria Park and I have never seen it do any harm. Its psychological effect is great; whether it has any other value I do not know. I am inclined to doubt it. The allied substances, guaiacol and ichthyol, can be used. Arsenic, I think, is of value, and also tonics such as iron, quinine, hypophosphites, glycerophosphates. Iodine and intensive iodine treatment have been employed, but there is no evidence that it is of any special merit.

The efficacy of cod-liver oil is well known. It is valuable for its nutritive properties and vitamin content. An attempt has been made to isolate a specific substance, but it has not so far been successful. Malt is both a food and a digestive ferment and contains, of course, vitamin B. Calcium has some reputation in the treatment of tuberculosis, and many wild claims have been made for it. Successive generations of my house physicians, fired by enthusiasm after reading these reports, ask permission to use it, so that I have had plenty of opportunity of watching its effects, but I have not been very favourably impressed. It is, however, well worth trying, especially in acute cases, in one or other of the various preparations available. Yeo's inhaler—with carbolic, creosote, treatment in, iodine and ether—is also worth trying. fully equipped relief of cough much ingenuity may be good. All advantages will frequently stop all coughing. temperatures are dangerous to read let the cough instead of taking their trays. bed will surprise how are strolling to the nearest and which the patient is

PULMONARY TUBERCULOSIS

taught control. Such simple remedies as glycerine and lemon, and black currant sweets may help, or pastilles of slippery elm or menthol and cocaine may be used. Other preparations which help greatly are hydrocyanic acid, numerous opium preparations, tinct. camph. co., linctuses containing some form of opium or heroin, the delectable syrupus cocillana co., cocaine and cannabis indica. An excellent list of remedies for cough will be found in the therapeutic index of Martindale and Westcott's "Extra Pharmacopœia."

AFTER CARE.

Points to be observed after the definite treatment period comprise the following :—

- (a) The general condition of the patient.
- (b) The weight.
- (c) The evening temperature—6.30 p.m., two or three years.
- (d) Sputum examinations.
- (e) Physical signs in the chest.
- (f) Periodic X-ray examination.

It is exceedingly difficult to persuade patients to submit to these precautions. It depresses them. They like to think themselves cured and to take no further thought for the body. I deeply sympathize with this attitude, but alas ! it is foolish policy and one which over and over again leads to disaster. We must explain that taking these precautions should not lead to worry and introspection, but do, in fact, remove the cause for worry. Slight exacerbations may occur from time to time, causing a rise of temperature. If the patient will rest at these times he will prevent a lighting up of a small focus and gain more immunity. Herein lies the value and importance of such an institution as the Papworth Colony, where patients can work under

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suitable conditions and under observation.

SPECIFIC TREATMENT.

If under the regime mentioned above the disease continues to advance and it is bilateral, can we make any attempt at specific treatment? There are four possible ways known to us of treating infective disease specifically :—

- (a) Killing bacteria direct.
- (b) Neutralizing toxins.
- (c) Stimulating antagonistic mechanisms, whether in blood or tissues.
- (d) Making an unfavourable soil or medium for the growth of the organism.

In tuberculosis there are three remedies for which specific claims have been made :—

- (1) Sera.
- (2) Tuberculins.
- (3) Gold (Sanocrysin or Crysalbine).

(1) *Sera*.—From time to time antitoxic sera have been introduced. Starting with the usual flourish of trumpets and the usual record of marvellous results, they have enjoyed a brief season of favour and then have been found wanting. Such were Maragliano's and Marmorek's serum. In another category was Mr. Spahlinger's serum, which I have had opportunities of testing and which now rests obscured beneath a well-deserved cloud. Of Uhlenhuth's serum, a horse serum prepared by injecting horses with a virulent tubercle bacilli, I have had no experience nor have I heard of any recent results. An antiserum was at first used in the early days of the administration of Sanocrysin, made by injecting horses with Dreyer's diaplyte tuberculin, but was soon given up as useless.

(2) *Tuberculins*.—So plausible are the claims made from time to time on behalf of different tuberculins

PULMONARY TUBERCULOSIS

that I am almost compelled to review and re-review my opinion and to try and try again. But I am afraid it is the old story once more—a new tuberculin, an evanescent popularity, then swift decline. I have not had a large personal experience of the older tuberculins; but when Dreyer's diaplyte tuberculin was first introduced, through the Medical Research Council and the energies of Dr. S. Roodhouse Gloyne, I was able, with my colleague, the late Dr. Clive Riviere, to make a fairly exhaustive test of this, but found it useless. It was possible, in acute cases, to work up to enormous doses, to desensitize patients completely to tuberculin, yet with no beneficial effect whatsoever on the clinical course of the disease. To test it further, I tried giving enormous initial doses in cases of tuberculous meningitis and got no reaction at all of any kind, which would appear to show that it has no influence at all on closed tubercles. Nevertheless, as a non-specific protein shock reaction it may do good in certain cases, if carefully controlled, and it seems that it is on the lines of tissue stimulation rather than on bactericidal action that we have the greatest hope of curing the disease.

(3) *Gold Salts*.—For a long time gold has had a reputation in the cure of tuberculosis. Many other substances have also been tried—antimony, arsenic, calcium, cobalt, copper, mercury, nickel, silver, sulphur—yet none has proved of real value, though some have obtained temporary popularity. An exception ought perhaps to be made in favour of arsenic, which, given as Fowler's solution, does appear to have some sort of tonic effect.

I remember in 1913 seeing several cases treated by potassium auro-cyanide. More recently Professor Møllgard has introduced the well-known double thio-sulphate of gold and sodium; Crysalbine is a similar preparation. Knud Secher, in his book on Sanocrysin, published in 1926, claims that if used at the right stage

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that I am almost compelled to review and re-review my opinion and to try and try again. But I am afraid it is the old story once more—a new tuberculin, an evanescent popularity, then swift decline. I have not had a large personal experience of the older tuberculins; but when Dreyer's diaplyte tuberculin was first introduced, through the Medical Research Council and the energies of Dr. S. Roodhouse Gloyne, I was able, with my colleague, the late Dr. Clive Riviere, to make a fairly exhaustive test of this, but found it useless. It was possible, in acute cases, to work up to enormous doses, to desensitize patients completely to tuberculin, yet with no beneficial effect whatsoever on the clinical course of the disease. To test it further, I tried giving enormous initial doses in cases of tuberculous meningitis and got no reaction at all of any kind, which would appear to show that it has no influence at all on closed tubercles. Nevertheless, as a non-specific protein shock reaction it may do good in certain cases, if carefully controlled, and it seems that it is on the lines of tissue stimulation rather than on bactericidal action that we have the greatest hope of curing the disease.

(3) *Gold Salts*.—For a long time gold has had a reputation in the cure of tuberculosis. Many other substances have also been tried—antimony, arsenic, calcium, cobalt, copper, mercury, nickel, silver, sulphur—yet none has proved of real value, though some have obtained temporary popularity. An exception ought perhaps to be made in favour of arsenic, which, given as Fowler's solution, does appear to have some sort of tonic effect.

I remember in 1913 seeing several cases treated by potassium auro-cyanide. More recently Professor Møllgard has introduced the well-known double thio-sulphate of gold and sodium; Crysalbine is a similar preparation. Knud Secher, in his book on Sanocrysin, published in 1926, claims that if used at the right stage

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it is possible to obtain with Sanocrysin a *sterilisatio magna*. Needless to say, it is a greatly exaggerated claim which subsequent experience has by no means confirmed. During the last three years I have treated between forty and fifty cases with gold, and I am still in a state of uncertainty with regard to its value. I have chosen two types of cases—the one, patients with advanced disease, who are obviously going rapidly downhill with what is called the exudative rather than the fibrotic type of tuberculosis; and the other, patients who, while not afflicted with a large area of disease, are unable to put up any effective resistance, and who, in spite of prolonged sanatorium treatment, remain constantly febrile with tubercle bacilli constantly present and who are slowly losing ground. Of the cases I have treated, ten have responded in what appeared to be a very striking manner, losing their fever and their tubercle bacilli, with the picture changing from one of steady progress of the disease to an arrest of it. For the remainder, and by far the greater number, no beneficial effect was obtained. Of course, the difficulty in these successful cases is to know what would have happened if Sanocrysin had not been used, and time alone will show whether Sanocrysin is really effective. In the second type of case I have mentioned, I think it is well worth trying if the patient does not experience any unpleasant or serious reactions. At the beginning, we used much larger doses, but now the general consensus of opinion is in favour of small doses beginning with 0.05 of a gram, giving injections at six-day intervals, and working up to 0.1, 0.25 to 0.5 of a gram and continuing at this dose until the patient has received 5 grams. The course is then repeated a few months later. Sometimes when there is no reaction I still occasionally give 0.75 of a gram at one dose, but I no longer give the full gram.

An aura of suspicion seems to rest over Sanocrysin

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because of stories of terrible reactions. Such reactions are possible, but if care be taken they are very unlikely to occur. It must be given intravenously with the same precautions as salvarsan, as it is extremely irritative to the tissues. Reactions that may occur are albuminuria, which, if slight, may be ignored; but if blood cells and casts appear in the urine, injections must be stopped until the urine is absolutely normal; Other reactions include ulceration in the mouth, nausea or vomiting after the injection, diarrhoea, a generalized scarlatinal erythema which soon passes off and does not seem to matter much, and lastly, dermatitis with loss of hair. At the slightest sign of dermatitis the injections must be stopped and, in my opinion, never repeated. If small doses are used and all reactions carefully observed, no serious complications should arise.

SURGICAL PROCEDURES.

If the case be unilateral and progressive, in spite of the most careful treatment, there can be not the least doubt that something more should be done.

(1) *Artificial Pneumothorax*.—With this method of treatment, when successfully induced, we can completely rest the lung and in many cases stop the progress of the disease. It is simple, painless, and, if not doing good, can easily be undone. It is one of the most ingenious methods of treatment ever devised and one of the most dramatically successful in its results. In spite of this I am altogether opposed to employing it in early cases of pulmonary tuberculosis. In all cases I would give Nature every chance to heal the patient. There are many reasons for this which have been put forward so many times that it is not necessary, even if there were time, to do so again now. Apart from severe recurrent hæmoptysis and a rapidly spreading tuberculous bronchopneumonia, the following

is what I consider the indication for artificial pneumothorax—unilateral disease, namely, which is spreading in spite of careful and prolonged treatment on strict sanatorium lines—it should not depend on the extent of the disease. It may be difficult to know exactly when to decide to step in and induce pneumothorax, but if the case is under observation it usually, sooner or later, becomes obvious when this should be done. If there is fever which will not subside, if there are repeated hæmorrhages, if tubercle bacilli are constantly present in large numbers, if there is a cavity which is increasing rather than diminishing, if the general condition of the patient is not good, if he is unable to get about without showing signs of toxic absorption, if signs and the X-ray picture show an increase of the affected area, then artificial pneumothorax should be considered. The length of time during which it must be kept up will vary greatly according to the case, and the termination of a pneumothorax is often a most difficult and anxious problem. If, however, the patient can be observed carefully during the process of expansion of the lung, then it is usually, but not always, possible to know whether any reactivation of the disease is taking place. In any case, it is better to warn the patient that the treatment will probably be necessary for at least two or three years—in advanced cases longer.

(2) *Oleothonax*.—A common complication during the course of artificial pneumothorax is a pleural effusion. This can frequently be ignored and it will disappear. Sometimes it can be allowed to remain for quite a long time with no apparent ill effects. Sometimes, however, the amount of fluid is so great that tapping is necessary and then, if a tendency to repeated re-accumulation of fluid occurs, there is a danger of the pleural space becoming smaller and smaller and a

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condition known as obliterative pleurisy may occur, which will undo all the good work that has been done and is one of the dreaded complications of the treatment. The same may occur after two or three attacks of pleurisy with a comparatively small amount of fluid. When obliterative pleurisy has once well started, no amount of air pressure will keep the pleural layers apart. Little by little, with invincible force, the tentacles of contracting fibrous tissue draw the pleural layers together from below upwards. By drawing off the fluid and replacing it by olive oil containing 5 per cent. oil of gomenol, this process may be prevented. Even though the pleural layers come together at the base, the oil will be driven to the upper part of the chest and then the space can be contracted no farther and it is usually just this upper part that we want collapsed. In this way, a condition which might render the severe surgical procedure of thoracoplasty necessary may be prevented.

(3) *Phrenic Avulsion*.—If because of adhesions an artificial pneumothorax cannot be induced, what other methods have we at our disposal? The simplest is phrenic avulsion. Under a local anæsthetic the phrenic nerve is exposed in the neck, held with forceps, cut above and then carefully dragged out by gentle pulling until the whole length and some of the diaphragmatic branches come out whole. This is specially indicated in basal tuberculosis and may be sufficient to bring about an arrest of the disease. It is worth trying in any case, even though it be but a preliminary to more drastic procedures. The reaction is usually very slight. Patients can even walk about the day after the operation.

(4) *Apicolysis or Pneumolysis*.—If the disease be apical the next least severe procedure is the so-called apicolysis. An incision is made between the second and third ribs or in the axilla; the ribs are retracted, the

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The Heart and the Way in which it is Supported during Life.

By G. ARBOUR STEPHENS, M.D., B.S., B.Sc.

Consulting Cardiologist to King Edward VII Welsh National Memorial Association, etc.

FOR the engine of a motor-car to be able to do its work properly it is necessary that it should be firmly fixed to the chassis, otherwise its efficiency is very seriously impaired. Similarly, it is very necessary for the heart, which is continuously contracting throughout life, to be properly supported, so that its action shall not be disturbed by any change of position on the part of the human being. The heart must be able to work satisfactorily whether a person is standing, sitting, or lying down, and must be ready to fit in with any rapid change from one position to another.

The heart is kept satisfactorily supported by means of the pericardium, which surrounds it almost entirely, but the way in which the pericardium functions as a support is not at the present time thoroughly understood. I have pointed out that in health there is in the pericardial cavity a negative pressure of 8 cm. of water, which means that there is a suction action which keeps the pericardium in close and intimate touch with the whole surface of the heart, and separated from it only by a thin layer of pericardial fluid. In disease this negative pressure disappears, and with it of course the suction action. Consequently the pericardium does not fit up closely to the heart as in health, and is not therefore able to give it the support which it requires. The question naturally arises—what evidence is there

parietal pleura is stripped from the chest wall by the hand, and the whole of the upper lobe pressed down by the fingers or fist. Into the space so produced either fat or plastic paraffin is pressed and the incision sewn up firmly. It is an excellent operation involving little shock, but unfortunately both of the packing substances used are apt to be extruded little by little through a pin-hole sinus. Nevertheless, though this may happen, a large apical cavity may remain closed with its walls adherent.

By pneumolysis is meant a similar stripping of the parietal pleura and packing over some part of the lung other than the apex.

(5) *Thoracoplasty*.—If these methods fail or if the disease is too extensive for the lesser procedures, then thoracoplasty must be considered. Performed on the right type of case the results are marvellously good. I have seen most brilliant and lasting results from the operation, but there is no disguising the fact that it is a big operation and one would think more than once before recommending it. It demands the most perfect technique and the most complete comprehension of what is to be achieved. The following are the types of cases suitable for a thoracoplasty:—

(a) If a successful artificial pneumothorax has been allowed to terminate and there has been a recurrence of symptoms and recollapse is not possible.

(b) If an artificial pneumothorax be imperatively indicated in a case of progressive unilateral disease, yet by reason of adhesions it is not possible to induce one.

(c) If chronic unilateral disease is present causing distressing symptoms—excessive expectoration, recurrent hæmoptysis, fever, inability to work, etc.

(d) In cases of persistent tuberculous empyema causing toxic symptoms, which will not yield to air or oxygen replacement or replacement by gomenolized olive oil.

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of this lack of support ?

A reference to the two diagrams, which have been

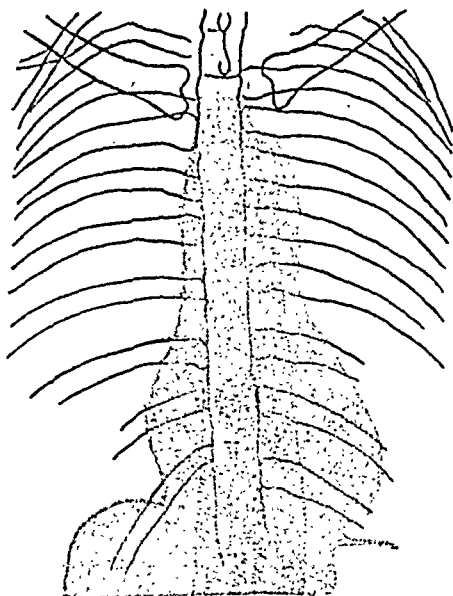


FIG. 1.

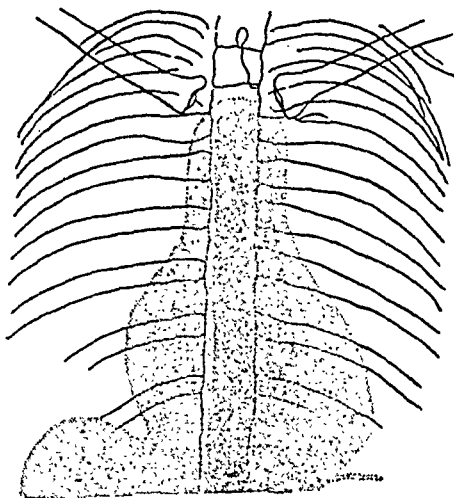


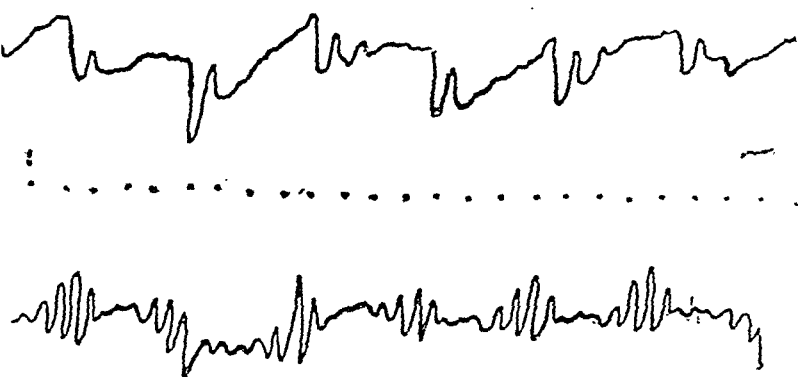
FIG. 2.

drawn from X-Ray photographs—Fig. 1 taken in the upright position, and Fig. 2 when the patient was lying

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down—is sufficient to show that there is a considerable amount of difference between the shapes of the heart in those two positions. These skiagrams are representative of a series taken from patients suffering from heart disease, and in nearly all of them we find there is a very definite difference to be seen, whereas in health no such change is brought about when the position of the body is changed. If this change is an accompaniment of disease, it is well for us to try to find out to what extent it is a criterion of disease, and in order to do this, I think we should consider the changes which are to be seen in the polygrams taken vertically and horizontally, and also between the heart sounds heard in those two positions.

Fig. 3 shows the polygram taken first in the vertical and secondly in the horizontal position, from a



2

FIG. 3.

patient suffering from heart trouble. These polygrams were taken by means of a small chest piece, one inch in diameter, and show a change in the shape of the waves. In Fig. 4 can be seen the polygrams taken from the same patient, first vertically and secondly horizontally, but with the aid of a much larger chest piece which

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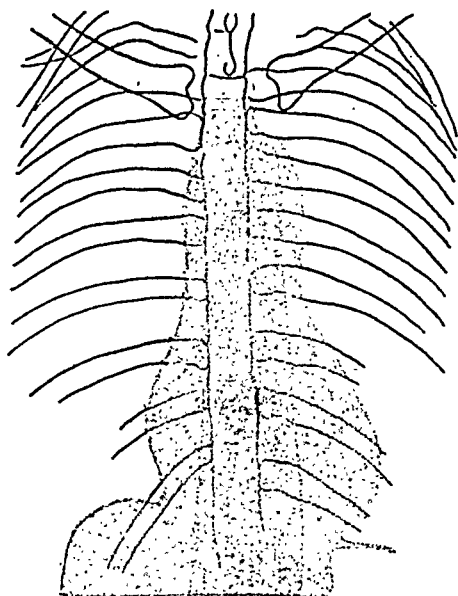


FIG. 1.

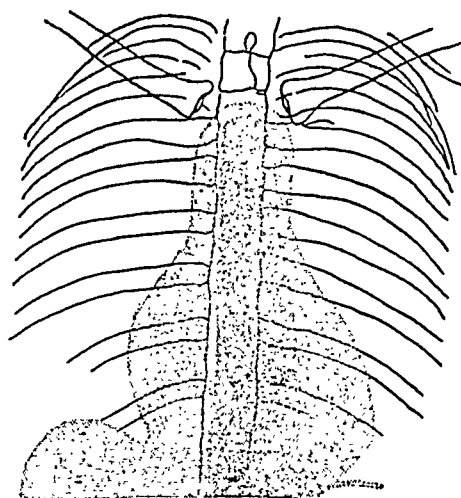


FIG. 2.

drawn from X-Ray photographs—Fig. 1 taken in the upright position, and Fig. 2 when the patient was lying

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consider the pulse in health and disease. The pulse is a wave which travels along all the arteries, which are kept more or less taut by the blood within them. The pulse is not, as is often imagined, a wave of distension comparable to the passage of a food bolus along the alimentary canal of a snake, but is much more like the wave on a violin string when it is struck. If the string be taut one gets a series of definite and regular waves, but if the string be slack the waves vary considerably in size and shape. In both cases it is the striking of the string that produces the waves, but the shape of the waves depends to a great extent on the tautness of the string. Similarly with the pulse. The pulse wave is started by the thrust of the heart, and associated even in health with the jerk or mass movement of the pericardial fluid, which must always occur when the heart contracts. In disease, when that fluid is not properly restrained, the jerk or jerks communicated by the fluid are more numerous and not so regular, except when there is a marked pericardial effusion. In this case the mass of the fluid limits its own movements and consequently no jerks are communicated to the pulse.

In this connection, reference might be made to the sounds heard when estimating the blood pressure. Some extraordinary explanations have been made as to how these sounds are caused, but in my opinion the hearing of these sounds is entirely dependent on the conducting capacity of the more or less compressed artery, the compression being comparable to the tuning of a violin string.

When examining a healthy heart one finds that the sounds heard are practically the same in both the vertical and horizontal positions, but in disease these sounds have a tendency to change, as the patient changes his position. If we accept the ordinary explanation with regard to the causation of the heart sounds, it is very difficult to understand why such a

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covers a much larger area of the pericardial fluid. Here also one sees a great deal of difference in the curves, and also between these and those taken with a small chest piece. If these curves are due merely to the action of the heart, one ought to find no difference between any of the curves, but in my opinion the additional waves at least can be explained only by assuming that they are due to the movements of the pericardial fluid.

In health, when the negative pressure produces a

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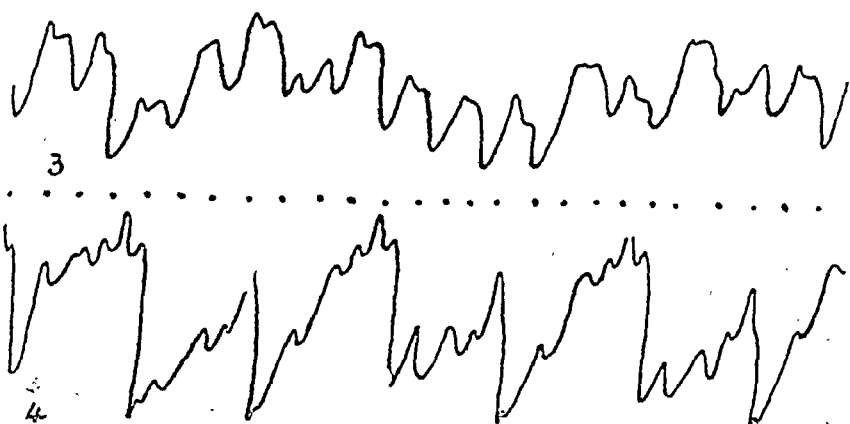


FIG. 4.

satisfactory suction action, the fluid movements are properly restrained, and no changes are observable when the person changes from the vertical to the horizontal position and *vice versa*. In disease, however, when the negative pressure is disturbed and the suction action is wanting, the fluid movements are much more unrestrained and consequently become recorded in the shape of additional waves on the polygrams, whilst the heart's position in the fluid changes as the result of the action of gravity.

In order more fully to appreciate this point, let us

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When this pericardial support weakens, the lubrication of the heart is seriously affected, and this is a point which ought to be much more carefully considered than it is at present. The heart as a continuously moving organ requires to be very carefully lubricated, and this lubrication is carried out by the pericardial fluid, which must be of a standard quantity and quality. In health the suction action due to the negative pressure keeps this fluid at an equal thickness all over the surface of the heart, but in disease, with the suction wanting, gravity prevents the heart from being satisfactorily lubricated.

The variations, therefore, which are found in disease in the shape of the heart, in the polygrams and heart sounds, are evidence also of a disturbance of the cardiac lubrication. The pericardial fluid in health is kept up to its normal quantity and quality by the exudation which takes place through the walls of the coronary vessels. A muscle, when it contracts more quickly than usual, becomes more freely supplied with blood, and more exudation takes place. Consequently, in exercise, when the heart moves more rapidly, exudation is increased, and the quantity of pericardial fluid becomes greater. As a result, this more rapidly moving heart is more freely supplied with lubricating fluid, and during the time that the quantity of pericardial fluid is being added to there is a certain amount of distress, which passes off as soon as the person has recovered his "second wind."

In disease of the heart, when the muscle fibres are not working as they ought to, exudation becomes irregular and the pericardial contents become abnormal. In most of the X-ray photographs I have seen, the greatest change in the shape of the heart seems to be in the neighbourhood of the left auricle. This is what might have been expected as a result of disease when fibrillation occurs. The thin walled auricle is the first

change should take place, but if the heart sounds are, as I have on previous occasions pointed out, due to the movements of the pericardial fluid, the change in the sounds is easily understood. It is well for us to realize that the energy which passes up the tube of the stethoscope from the chest piece to the ear is the same energy as that which passes up the tube from the chest piece to the tambour of the polygraph. In the case of the stethoscope, that energy gives rise to sounds, whereas in the case of the polygraph it gives rise to curves or polygrams.

As can be seen by reference to the diagrams, the changes between the vertical and horizontal curves are considerable, and it is no wonder, therefore, that there are considerable changes in the sounds heard.

One can realize this difference better if one uses a stethoscope with a large chest piece which covers a much greater area of the heart or pericardial surface, and consequently allows of far more fluid movements being brought within the range of hearing. When using a stethoscope of this sort one hears in health, especially in the case of a child, two sounds which are very different from the orthodox "lūbb dŭp" associated with the small chest-piece stethoscope. These sounds in health are heard as two equal sounds, but in disease, when the shape of the heart changes—as shown by X-rays—or when there is a considerable variation between the polygrams vertically and horizontally, the first sound seems to be very much prolonged, whilst the second sound almost disappears. Between the two equal sounds of health and the one prolonged sound of disease there are various stages. For example, the ratios may be written $1-1$, $1-\frac{1}{2}$, $1-\frac{1}{4}$, $1-0$, and may therefore be used together with the polygram and X-ray photographs to help us to form some estimate of the weakness of the support rendered to the heart by the pericardium.

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In order to see how this formula applies to cases of disease, let us consider a case of beri-beri, in which, from the beginning of the disease, the whole heart—as shown by X-rays—is enlarged, especially over the region of the left auricle. The heart failure is evidenced by the increasing stasis which takes place in the liver and venæ cavæ, sometimes giving rise to painful swellings of the liver, ascites, and occasionally sudden death. Even in the most serious cases, however, one can never find any irregularity of the heart, extra systoles, flutter or fibrillation, whilst the electrocardiogram is practically normal. There is a general feebleness of circulation, and palpitation takes place on the slightest exertion. In this disease the blood-pressure is so low as not to be able to set the auricular fibres into a state of tremor or fibrillation, although the support for the heart has been considerably reduced. All this seems to point to the fact that there must be a certain definite ratio of blood-pressure present before the auricle fibrillates.

The fact that the nerves are affected in beri-beri will also account for a diminution in the number of impulses conveyed to the heart, so that both $P + I$ being reduced in quantity the tendency to fibrillation is very small. The marked exudation which takes place in beri-beri has an effect on the intra-pericardial condition, resulting in a diminution of the negative pressure. The excessive exudation in and amongst the muscular fibres of the heart diminishes the tone of the heart muscle, so that $S + T$ represents a diminished total, which favours the tendency to general heart failure. The sudden death which is liable to take place in cases of beri-beri, and is so closely associated with this disturbed exudation in the pericardial cavity, is, I think, a matter of very great importance, and may help us to a full and proper appreciation of the circumstances leading to angina pectoris. I have already

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to suffer from the lack of support and to give evidence of fibrillation.

These facts which I have brought forward seem to suggest that it is necessary to have some other theory for the causation of fibrillation instead of the one at present generally accepted. To suggest that the diseased muscular fibres of the auricle are capable of developing fresh centres of excitation seems contrary to the usual rule regarding dying matter, whereas on the other hand the diseased fibres and the thin and badly supported wall of the auricle lend themselves to be thrown *passively* into a state of tremor. The following two simple experiments bear out, I think, my contention:—

If one attaches a length of tubing about 2 ft. long to an ordinary cold water tap and then allows the water to run, it will be found on gradually compressing the distal end that the whole length of the pipe is thrown into a state of tremor.

The other experiment consists in connecting a piece of rubber tubing with a small rubber balloon and filling both with water. It will be found that on rubbing the rubber tube vigorously the balloon is thrown into a state of fibrillation.

In the first case, as soon as the rubber piping has reached the stage when it cannot resist the extra pressure, its walls become relatively feeble, and, consequently, fibrillate.

In the second case, the unsupported rubber balloon responds at once to the introduction of the smallest increase of pressure or additional impulse.

To put it mathematically, one can say that this feebleness or failure of the walls varies directly with the pressure and any additional impulse, whilst it varies indirectly with the amount of support which is given to the walls—a statement which applies equally to the heart as to the rubber tube and balloon in the experiment. Written as a formula one can say that:—

$$F = \frac{P + I}{S + T}$$

F = failure or fibrillation.

P = pressure.

I = impulses.

S = support.

T = tone of muscle.

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drawn attention to the distress which occurs during the period previous to the arrival of an athlete's "second wind," due to the rearrangement which has to take place in connection with the lubrication of the heart. In beri-beri this lubrication is so seriously disturbed as to bring about sudden death, a result which is still further helped by the diminution of nervous impulses conveyed along the impaired nerves.

In angina pectoris it is my opinion that the intra-pericardial exudation is even more seriously affected, in that the change takes place very much more rapidly. One might almost compare the sudden increase of intra-pericardial exudation to that exudation which takes place in urticaria, and it is interesting and important to note that a large number of cases of persons who suffer from angina pectoris have many, if not most, of the characteristics of people who suffer from urticaria, e.g. the "ether reaction of urines." In angina pectoris this sudden exudation, with its equally sudden disturbance of the intra-pericardial pressure, so modifies the tension in the sac as to be the cause of the agonizing pain which accompanies this disease, while the fact that one finds after death so little evidence of organic disease is in favour of this contention; and even in those cases where the coronary vessels are affected, such an affection is the very one which would be responsible for, or closely associated with, a serious disorder of the normal exudation in the heart. In one case of angina pectoris, when I was listening to the heart as an attack came on, I distinctly heard a splash as of fluid, the movements of which were seriously disturbed.

The great value of digitalis in treatment is due to the distinct effect it has on the contraction of the muscular fibres of the heart and therefore on the exudation which takes place through the coronary vessels; in fact, it seems as if all the drugs such as pituitrin,

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adrenaline and amyl nitrite, which are used in various cases of heart disorder, owe their success to the effect which they have on the capillary circulation together with the exudation so intimately associated with it.

A heart whose valves are more or less destroyed by disease, but whose myocardium and exudatory powers are in good condition, is able to work wonderfully well because the lubrication is kept normal; but a heart which has poor and inadequate lubrication is a heart whose myocardium and myocardial vessels are in a bad condition and require suitable treatment. Cases of this latter kind are amongst those which respond satisfactorily to treatment, but much depends on an early diagnosis.

If my views be correct regarding the changes shown by the X-ray photographs of the heart, the polygrams and the heart sounds, which take place as the result of change of position, then I venture to hope that a proper use of these methods may be of considerable value in the classification of cases in order that we may be able to find out readily those which we can decide definitely will get well even if we cannot state the degree of recovery in all the other cases.

Osteomyelitis.

By HAROLD EDWARDS, M.S., F.R.C.S.

Assistant Surgeon and Surgical Tutor, King's College Hospital, etc.

PYOGENIC bone diseases fall into two groups, open and closed. In open infections a wound is present which allows the infecting organism, or organisms—for the infection is not infrequently a mixed one—direct access to the bone. Most of the cases are compound fractures, but the condition may follow an emergency amputation, and is not an uncommon sequel of rib resection for empyema. The whole bone, cortex medulla and periosteum is affected, and a periosteomyelitis results. Occasionally a localized area of periosteum may be infected through a wound which goes down as far as, but not through, the bone.

In present-day civil practice open periosteomyelitis has few terrors. Steps are taken to prevent gross infection of the bone in compound fractures by operating upon the case without delay, excising the skin edges, and removing any severely damaged tissue. It is my practice to insert a series of Carrel tubes and through them to irrigate the wound with Dakin's solution or half-strength eusol. Infection, if it now occurs, is usually a mild one, and gives rise to little or no constitutional disturbance. Unlike closed infection of the bone, the products of bacterial infection are able to escape through the open wound, and are not absorbed to cause the severe toxæmia of the former condition. To use a Hibernianism, the condition has been operated upon before it has arisen. Sequestra, which may form, are small as a rule, and may be ring shaped, a thin flake separating from the whole circumference of the bone. These sequestra usually discharge through the wound

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by natural means, and operation to achieve this end is rarely required.

In closed infections it is apparent that the organism may reach the bone in two chief ways, by direct extension from an adjacent septic focus, or via the blood stream.

There are very many examples of the former: Acute mastoiditis from middle-ear disease, alveolar abscess from dental infection, a phalanx in whitlow, and the articular ends of the bones in acute arthritis. This latter condition is most frequently met with in acute infection of the knee-joint following a penetrating wound into the joint.

Infection via the blood stream, infective hæmatogenous periosteomyelitis, is the form of the disease which demands the closest study, for a clear understanding of the clinical aspects of the disease and its pathology is essential if treatment is to be successful.

The disease is one of childhood. In 100 consecutive cases of pyogenic infection of bone of all types admitted to King's College Hospital, 61 were blood-borne, and of these all but five were before the age of 16, and all but two before the age of 21. The maximum incidence appears to fall between the ages of 13 and 14, but there is a definite peak between the ages of seven and eight; 78 per cent. of the cases were in boys. This greater incidence in boys is to be found in all statistics relating to the disease. It is customary to explain it, quite erroneously I believe, on the ground that boys are more liable to injury than girls, injury being regarded, as we shall discuss later, as a predisposing cause of the condition. An examination of the sex incidence of injury in my cases appears to put this simple explanation out of court, for in eight cases in which it was definitely stated that there was no injury, seven, or 87·5 per cent., were in boys. This corre-

sponds with the general incidence in boys (78 per cent.).

In the absence of any adequate reason for the sex incidence, osteomyelitis must be placed with that series of diseases of children which show a baffling preference for the male. Other examples are congenital stenosis of the pylorus and intussusception.

The tibia, femur, and humerus are the most frequently affected bones, in the proportions of 22 : 14 : 9. Other bones are the ulna and os calcis three; the radius and clavicle two; the ilium, fibula, astragalus and a metacarpal one each. These figures do not take into consideration secondary abscesses which appeared in distant bones during the course of the disease.

In all but three cases the infection started at the articular ends of the bones, and, apart from one case which appeared to begin in the lower epiphysis of the femur, within the soft cancellous bone immediately beneath the epiphyseal cartilage. The three cases in which infection commenced in the shaft of the bone all presented unusual features. One was a very chronic form of the disease, and only a scanty growth of staphylococci was obtained from the pus. In another there was a long history, and the bone was sterile. In the third there was an abscess underneath the periosteum, but the medulla of the bone was not infected as far as could be determined at operation. In the two cases in which the disease occurred in people over 21, the ages were 31 and 62. The former followed the course usual for the disease in children. The latter followed an injury to the lower end of the tibia, and the history suggests an infected subcutaneous hæmatoma, with secondary involvement of the bone.

Why is the diaphyseal side of the epiphyseal line so constantly the site of commencement of the disease? Two theories are in evidence in answer to this question. They may be called the injury and vascular theory respectively. With regard to injury, the cancellous

bone beneath the epiphysis is probably less strong than the remainder of the bone, and, consequently, more readily injured. Moreover, ligaments are frequently attached in this region, and strains of the joint may be transmitted to it. It has been suggested that injury causes a hæmatoma, and that this becomes secondarily infected. The obvious counter to this hypothesis is that in obvious slipped epiphysis, where a large hæmatoma is always present, infection is rare.

Whatever be the truth of the above contentions there is no doubt that injury plays an important part in this disease. In the present series injury preceded onset in 20 cases and was absent in eight. In the remainder no statement was made. Of the 20 injuries, 15 were tolerably severe and consisted of direct blows or wrenches, and five were of a vague character, such as overstrain at tennis.

In nine of the 15 cases of definite injury the upper end of the tibia or the lower end of the femur were affected (60 per cent.), whereas the total percentage incidence of osteomyelitis in these situations is only 24 per cent. Of 13 recorded cases of secondary abscesses, in which trauma could have played no part, not one was in the bones of the knee-joint. Further, of the eight cases in which trauma was absent, the tibia was the bone affected only once, and this was a chronic case, in which the bone was sterile.

The inference to be drawn from these facts is that hæmatogenous periosteomyelitis of the lower end of the femur or the upper end of the tibia rarely occurs in the absence of injury. What most interests us, and in this connection there is a definite legal bearing, is the possibility of injury being directly responsible for the disease. We may take it that during the lifetime of the child, pyogenic organisms succeed from time to time in gaining entry into the blood stream and circulating with the blood. If the child be in good

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portion posteriorly, lies within the capsule of the hip-joint. Involvement of the joint always occurs, and usually early in the course of the disease.

In 67 per cent. of 37 cases the organism was the *staphylococcus aureus*. This figure is in keeping with other published statistics. Other organisms occurred as follows: *Staphylococcus albus* and *streptococcus* three cases each; *pneumococcus* two cases; *enterococcus* one case. In three cases no culture was obtained from the bone.

CLINICAL ASPECTS.

It is possible to distinguish four clinical types of the disease, although no hard-and-fast line separates them. They are (a) Fulminating type; (b) the ordinary acute type; (c) mild acute type; (d) a type which is chronic from the outset.

The Fulminating Type.—The bone lesion is solely a local manifestation of a general pyæmia or septicæmia of great severity. Although perhaps the least important, the bone lesion may be the only localized sign. Two cases in this series serve as illustrations, one of a generalized pyæmia, and the other a severe septicæmia.

A girl, aged three years, complained of pain in the right leg and refused to walk. She was admitted into hospital the next day. The right hip was flexed and slightly abducted and externally rotated. There was tenderness over the great trochanter, and the child screamed when passive movement was attempted. Flexion, abduction and external rotation were full. Other movements were limited. Fullness was present in front of the joint. Temp. 104°, white count 11,000. The hip was explored and found to be full of pus. A focus in the neck of the femur was found. Two days later a secondary abscess was opened in a metacarpal bone. She died on the fourth day. *Post-mortem* examination showed abscesses in both lungs, in both pleuræ, in the pericardium, in the heart muscle, in both kidneys, in the right elbow joint, and one of the interphalangeal joints. The organism was the *Staphylococcus aureus*.

A boy of fifteen years complained of pain in the left hip, which commenced four days before admission. There had been no injury. There was marked tenderness between the great trochanter and iliac crest on that side. The hip-joint appeared normal. An X-ray suggested a focus of infection in the ilium. Temp. 105°, white

health the organisms are separated from the blood and voided in the urine, and the blood becomes sterile again. Supposing that during one of these invasions of the blood the child is in a lowered state of resistance, from poor nutrition, for example, the organisms may succeed in gaining a footing in some tissue, more especially if that tissue is itself the site of local lowered resistance. Such a diminished local resistance may result from injury.

Would the disease have been avoided in the absence of injury in any particular case? In the bones forming the knee-joint there is little doubt that in many cases the injury is the determining factor. The difficulty lies in deciding in the individual case. The most that can be said is that in acute infection of the lower end of the femur or the upper end of the tibia the chances are that the condition would have been avoided had no injury occurred. The same cannot be said of the disease in other bones, for with them the relation to injury is not so clearly defined.

With regard to the vascular theory our knowledge is not on such sure ground. Repeated attempts have been made to show that the terminal (subepiphyseal) branches of the nutrient arteries are of the nature of end arteries, and, in consequence, hold up clumps of organisms which have gained entry into the bone vessels. Though recent experimental work appears to add confirmation to this view, as yet it must remain *sub judice*.

The juxta-epiphyseal situation of the infection has a very important clinical bearing. Owing to the proximity of the joint there is always an effusion into the synovial membrane. Infection rarely penetrates through the epiphysis, so that joint involvement is uncommon except in joints in which the subepiphyseal region lies inside the capsule. The best example of this is the neck of the femur, which, except for a small

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Joint signs are always present in slight degree because of the reactionary effusion already referred to. In the case of a focus in the neck of the femur, the joint signs predominate for the reasons given above.

In later cases a frank abscess may be present, which has broken through the periosteum. In one example in this series the case was undiagnosed for ten days, and when the patient arrived at hospital the whole tibia was found to be bathed in an enormous subperiosteal abscess extending from one articular end to the other. At operation the whole shaft of the tibia came away as a sequestrum.

Diagnosis is not difficult as a rule—a fortunate fact, for the best hope of cure lies in immediate operation. So extensive are the ravages of sepsis upon the bone, and so rapid in their course, that it is infinitely better to explore the bone if doubt exists rather than to run the risk of delayed operation.

The series under review shows that the greatest difficulties in diagnosis arise in connection with disease at the upper end of the femur. If the temperature is high and tenderness is present with swelling and flexion at the hip-joint, operate at once. If the temperature is not unduly high, e.g. 101.5° , and there is some swelling of the joint, aspirate. If pus is present, operate. If

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count 13,000. At operation pus was found coming from a focus in the ilium. Death occurred on the day after operation. The organism was the *Staphylococcus aureus*. This case is one of an overwhelming septicæmia, against which the patient had no chance.

In all there were six cases of this fulminating type. The intense toxæmia, which is characteristic of the condition, may so obscure the local lesion that diagnosis may not be possible at first, and this fact itself militates against the chances of recovery from the disease. The following case illustrates this:—

A boy of eight years complained of pain in the right hip four days before admission. There had been no injury. Temp. 104°, pulse-rate 140. The only physical sign present accompanying the severe toxæmia was flexion of the right hip. The urine contained albumen. The diagnosis of acute rheumatism was considered. Three days after admission the hip became swollen, and on the following day the presence of pus within the joint was demonstrated with an exploring needle. The joint was drained. There was a focus in the neck of the femur. A week later an abscess occurred in the left hip. This was drained. Death occurred in the following week. At *post-mortem*, abscesses were found in both lungs, both pleuræ, the pericardium, both kidneys, the right elbow, a phalanx, and beneath the skin behind one ear, in one axilla and behind one shoulder. The organism was the *Staphylococcus aureus*.

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The Ordinary Acute Type.—The history of a typical case is as follows:—

A male child, aged between seven and thirteen years, and in poor circumstances, has been in indifferent health for a few days. He wrenches his knee playing football, and though the knee is painful for a day or so, the pain eventually passes off. In another few days the pain returns, and the boy starts to limp. He says nothing of the pain to his parents, possibly for fear of the consequences. The next day the knee aches with increasing severity, is a little swollen, and feels stiff. He keeps it slightly bent, and it hurts him to alter its position. He feels ill, and looks pale. After a pain-racked and restless night, the local and general conditions are very much worse, and the now alarmed mother sends for the doctor, who find a very sick child, with a temperature of 104°, a pulse-rate of 120, and signs of infection in the bone.

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open. Culture of the contained material was sterile. The Wassermann test was negative.

A girl, aged six months, had pain in the shoulder, shown by a disinclination to move it. The arm got better after being strapped to the side. Subsequent X-ray examination showed thickening of the periosteum. The Wassermann test was negative.

In a third case a boy, aged ten years, had had pain in the tibia for five months. It was diagnosed as rheumatism. Eventually a swelling appeared. X-ray showed a very thickened bone. At operation diseased bone was removed, from which was obtained a scanty growth of *Staphylococcus aureus*.

The clinical lesson to be learned from the first and third of these cases is that all persistent mild pains in bone in children should be X-rayed.

TREATMENT.

In all cases except certain of the milder types of the disease the treatment is operative as soon as diagnosis is made. General principles decree that the bone shall be opened and drained. In soft tissues free incision and drainage present no difficulties. In the case of bone the difficulties of drainage are very great. The bone is composed of innumerable small channels, each harbouring infection, and it is obvious that free incision alone cannot effect drainage. The number of cases of chronic osteomyelitis which occur as sequels to the acute condition bears testimony to the difficulties confronting the surgeon in the treatment. Out of 46 cases of the acute type in this series, no fewer than 32 had subsequent operations for chronic osteomyelitis, some of them two and three, or even more. Even these figures do not reveal the whole truth, for a number of the original cases doubtless sought further treatment at other institutions. The surgeon has a choice of three methods:—

(1) Excision of the diseased bone and the formation of a gutter. This operation would be the ideal one in the early stages if it were not for the proximity of the lesion to the epiphyseal line, which prevents the operation from being properly carried out. There must be

there is no swelling and the local signs are not marked, or the fluid in the joint is not purulent, put the leg in a Thomas's splint with a weight extension of from 2 lb. to 5 lb., and maintain a careful watch on the patient. A certain number of cases resembling the disease turn out to be a mild, infective arthritis, and clear up rapidly under this regime.

In the majority of the cases of this type the organism was the *Staphylococcus aureus*. In two cases the *Staphylococcus albus* was found, and in one the enterococcus. In three the organism was the streptococcus.

The Mild Acute Type.—The course of the disease in cases belonging to this group is longer, and the local and general signs very much less marked.

A girl, aged three years, hurt her right leg one month ago, and had pain on the inner side for three weeks. On admission there was a large fluctuating swelling on the inner side of the tibia, with enlarged glands in the groin. Temp. 100°. At operation pus was found under the periosteum and in the medullary cavity. The organism was the *pneumococcus*.

A boy, aged nine, had pain in the thigh for a week. On admission there was slight tenderness of the lower end of the femur, with slightly diminished movement at the knee. There was some doubt as to the diagnosis. X-ray examination was negative. Nine days after admission operation was performed. Pus was found in the bone. The organism was the *pneumococcus*.

Though both the examples given are cases of pneumococcal infection, the mild form of the disease is not confined to the pneumococcus, for in one case the organism was the *Staphylococcus albus*, and although pneumococcal osteomyelitis may be suspected, it cannot be diagnosed with certainty because of this. The point is without practical importance.

The Chronic Type.—A certain number of cases are chronic from the first, and never enter into an acute phase. Three such cases occur in this series.

One was that of a boy, aged nineteen years. For a year he had noticed a swelling in the right thigh, which was slowly increasing in size and painful. Previous to admission it was diagnosed as a sarcoma. X-ray showed a cavity in the bone surrounded by an area of increased density. At operation the bone cavity was laid

Antiseptics.

By J. E. R. McDONAGH, F.R.C.S.

Surgeon to the London Lock Hospital; Member of the Chemical Warfare Committee; late Hunterian Professor to the Royal College of Surgeons, etc.

ANTISEPTICS are, for the most part, drugs used to kill micro-organisms directly and indirectly. Micro-organisms are killed directly only when the drugs are applied locally, and even then they function in part by raising the local resistance when the skin is broken. When the drugs are taken internally or injected, they kill the micro-organisms indirectly by raising the resistance of the host. The choice of antiseptic required depends upon how much the resistance needs raising, and this is influenced by the individual and by the micro-organism causing the infection. The individual should be considered first, then the micro-organism, and lastly the antiseptic.

The Individual.—The resistance of the host may be so taxed as to be incapable of being suddenly raised by the injection of antiseptics. If time permits, such a patient should be treated along general lines, and, provided the infecting micro-organisms have not entered the general blood-stream, recourse may be had to blood transfusions. But, once the infecting micro-organisms have reached the general circulation, blood transfusions are of value only when used in the early stage of the infection. If the resistance is capable of being stimulated, it is necessary first to ascertain whether or not the infecting micro-organisms have invaded the general circulation. This knowledge may be gained by making blood-cultures and by measuring the degree of dehydration to which the protein particles in the plasma have been subjected. Should the tests reveal a septicæmia, then the whole of the antiseptic

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no overhanging edges if the operation is to be a success. The presence of the epiphyseal cartilage prevents attainment of this.

(2) Excision of the diaphysis, with a bone graft at a later date. If the whole shaft has been destroyed, as in one case quoted above, the surgeon may be forced to adopt this measure. The operation is not generally to be recommended, because of the risk of subsequent deformity.

(3) Draining the medulla through a series of drill-holes through the cortex with subsequent fixation of the limb in plaster for a period of two or three weeks. Though strongly advocated by the late Clarence Starr, this method has not found great favour in this country.

In mild types delay is justified in some cases. If X-ray changes are present then the bone should be explored.

PROGNOSIS.

Apart from the fulminating cases, which are invariably fatal, the prognosis as to life is good. Only one case in this series was lost—that of a boy who died shortly after a second operation one month after the primary one. The younger the patient the worse the prognosis. The bone, too, is of importance. The more distal the better the prognosis. It is quite impossible to give a prognosis with any degree of certainty with regard to the local condition. Even though a healed wound may result from the first operation, the patient is never free from the possibility of a recurrence. In one case in this series an operation for removal of a sequestrum was performed exactly sixty years after the original operation for acute osteomyelitis.

My thanks are due to the members of the surgical staff of King's College Hospital for permission to investigate all of these cases.

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abnormal chemico-physical changes, enabling such micro-organisms as the staphylococcus, streptococcus, *Micrococcus catarrhalis*, influenza micro-organism, pneumococcus, *Friedländer's pneumobacillus*, *Bacillus coli communis*, etc., to develop pathogenic properties. In pregnancy the protein particles in the plasma undergo similar and even more severe abnormal chemico-physical changes, and this explains why infections are likely to be so virulent in the puerperium. With the exception of the streptococcus, the micro-organisms mentioned seldom occasion a septicæmia and their infectivity is readily quelled by such antiseptics as manganese butyrate, the symmetrical urea of para-benzoyl-para-amino-benzoyl-1-amino-8-naphthol-3-6 sodium sulphonate (Sup. 36) and benzoyl-para-amino-benzoyl-3-6-8-hydroxy-naphthylamine (B.N. 368) provided the drugs are injected sufficiently early.

The most common lesions caused by the staphylococcus are boils and carbuncles, which respond best to manganese butyrate. In infections caused by the *Micrococcus catarrhalis*, influenza micro-organism and pneumococcus Sup. 36 or B.N. 368 should be employed. In pneumonia, where the dehydration the protein particles undergo is accompanied by a varying degree of hydration, oxygen should be injected subcutaneously in addition to the antiseptic, because hydrated protein particles are dispersed best by negatively charged substances. In all these infections, and particularly in those where the *Bacillus coli communis* is active, an attempt must be made to rid the patient of the intestinal intoxication, not only to check the infection, but also to avoid a recurrence. The future will probably show that the differences between the various forms of the streptococcus and the lesions produced thereby are influenced mostly by the kind of abnormal chemico-physical changes to which the host's resistance has

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armamentarium should be put into action at once. In such cases, stimulation of the host's resistance by degrees is useless. There are a few points regarding these examinations which require emphasis.

Micro-organisms grown in a blood-culture are neither necessarily pathogenic nor necessarily infecting micro-organisms. Infecting micro-organisms invade the general circulation from a focus, and it is probable, having reached the blood-stream, they do not multiply therein. Therefore, in every case of septicæmia an attempt must be made to stop the further production of the infecting micro-organisms at the source of origin. In septicæmia the protein particles in the plasma forming the host's main resistance are subjected to a severe degree of dehydration, evidenced by a rapid sinking of the red blood-corpuscles, by a fall in the refractive index of the serum, by a rise in the percentage of the blood-sugar and blood-urea, and by a typical ultra-microscopic picture. All these are mentioned in detail in my volumes on "The Nature of Disease." In the acute stage of infections antiseptics function by checking the dehydration, and they fail in the last stage of an infection because the protein particles increase too much in size and become arrested in the lymphatic vessels, capillaries or veins to occasion death by shock.

The Infecting Micro-Organisms.—These may be divided into two classes: (1) Those infecting from within; (2) those infecting from without. The former are micro-organisms ordinarily saprophytic which become pathogenic when the resistance of the host is lowered too far. The resistance of the host is lowered most frequently by a familial chronic intestinal intoxication. Poisonous chemical products would appear to be formed in the large intestine from animal proteins by pathogenic mutation forms of the *Bacillus coli communis*. These intoxicants reach the blood-stream and subject the protein particles in the plasma to

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preparations of gold.

In the chronic stage of infections, negatively charged drugs are required to cause dispersion of the hydrated protein particles, and the most suitable are iodine, thyroxin, and the carbon di-sulphide product of diethyl-amine (contramine). As examples of acute infections from without gonorrhœa and syphilis may be cited. These infections require more powerful antiseptics because the degree of dehydration of the protein particles in the plasma is greater—in gonorrhœa, because the gonococcus is Gram-negative, and in syphilis because the *Leucocytozoon syphilidis* is a protozoon. In acute and uncomplicated gonorrhœa the symmetrical urea of meta-benzoyl-meta-amino-benzoyl-1-amino-8-naphthol-3-6-sodium sulphonate (Sum. 36) is the drug of choice, and in syphilis tri-valent arsenical compounds, bismuth, mercury and other metals with a large nucleus. In the chronic stage of syphilis penta-valent arsenical compounds are to be preferred because the arsenic is negatively charged and causes dispersion of the hydrated protein particles similarly to contramine. A chronic infection from without is bilharziasis, for which tartar emetic is almost a specific, as was first pointed out in my "Biology and Treatment of Venereal Diseases," published in 1915.

The Antiseptics.—Antiseptics employed to stimulate the host's resistance can be divided into two big classes : (1) Those positively charged which correct the dehydration by conveying electrons to the protein particles in the plasma; (2) those negatively charged which cause dispersion of the hydrated protein particles. The former are conductors and useful in the acute stage of infections, and the latter are condensers and useful in the chronic stage of infections. The conductors are likewise divisible into two groups : (1) Those where the conductor functionating atom is hydrogen; (2) those where the conductor functionating atom is a metal such

been subjected. It would seem to be the case that there is no fundamental difference between the *Streptococcus salivarius*, *faecalis* and *pyogenes*, and that scarlet fever, rheumatic fever, streptococcal septicæmia, etc., are intimately related. It is probable also that the ultra-microscopic viruses are particulate forms of the streptococcus, being formed when the streptococcus is subjected to anærobic conditions. This would explain why epidemic encephalitis is so apt to appear during or on the wane of an epidemic. So long as the streptococcus is not occasioning a blood-infection, Sup. 36 or B.N. 368 should be used at once and followed by daily intramuscular injections of the symmetrical urea of meta-benzoyl-meta-amino-methyl-benzoyl-1-naphthylamine-4-6-8 sodium sulphonate (Fournau "309," Bayer "205" or Sum. 468) until all signs of protein dehydration have been overcome. In septicæmia, in addition to the treatment just mentioned, antistreptococcic or horse serum and mercurochrome 220 should be injected without delay.

In all infections from within, antiseptics such as aspirin and hexyl-resorcinol may be prescribed internally, as they act by overcoming the protein dehydration. There is no drug prescribed internally which acts as an intestinal antiseptic and kills the pathogenic micro-organisms found in the excreta. Hexyl-resorcinol is not a specific urinary antiseptic and it acts by increasing the general resistance as does phlor-butyro-phenone, the active principle of Filix mas in helminthiasis. Hexyl-resorcinol may be replaced by phlor-butyro-phenone and *vice versa*. There are certain infections from within where the lesion produced is of a more chronic nature, such as tuberculosis, *Ulcus molle serpiginosum*, etc. In these infections antiseptics are used which both correct the dehydration and occasion dispersion of the hydrated protein particles, to mention tartar emetic and certain

Blood Films in Everyday Practice.

By A. J. FAIRLIE-CLARKE, M.Ch., F.R.C.S.

Surgeon to the Malvern Hospital.

IT has been said that in acute disease it is as important to examine the blood as it is to take the temperature. In chronic disease the same examination is also often suggestive, apart altogether from its value in recognized blood diseases. The interpretation of a blood film will supply much of the desired information. But to be most useful this information is wanted quickly—to wait for a report through the post is often useless, for when it arrives the time to act upon it may have passed. A rough smear, quickly examined, may be of more value than the report of an expert received later. Something is gained, therefore, if the practitioner, without too great demand on his time and with simple equipment always at hand, can prepare and examine a blood film for himself.

How a general practitioner attempts to make these "methods of clinical research applicable in general practice" is here described. He uses no cover-glasses, mounting media, alcoholic stains or immersion lenses; his reagents are stored dry and fresh stock solutions made at any time with tap water. In about half an hour of working time a blood film can be made, stained, examined, a rough estimate of the number of leucocytes obtained, and differential and polynuclear counts made.

The points to be emphasized are as follow. A thick, soft string is wound round the patient's finger from base to nail to ensure sufficient blood being in the tip. The drop of blood placed on the slide should be about

as manganese, iron, copper, silver, arsenic, bismuth, mercury, etc. In the former the hydrogen atom needs to be liberated from either a negatively charged hydroxyl and methyl group or from a positively charged carboxyl and sulphonate group attached to a vehicle having a large nucleus. In the latter, owing to the larger size of the nucleus of the metallic atom, there is not the same need to have a vehicle with a large nucleus. Should the metallic atom with a particularly large nucleus be directly attached to an aromatic vehicle, one or more of the valencies needs to be negatively charged for fear of the compound being too toxic, that is to say, producing too much protein hydration.

The kind of conductor called for depends upon the degree of the dehydration to which the protein particles in the plasma of the host have been subjected by the infecting micro-organisms, and experience is the most trustworthy arbiter. Examples of antiseptics functioning through a negatively charged hydroxyl group are Sup. 36, Sum. 36 and B.N. 368. In the symmetrical urea compounds the active hydroxyl groups are those in the 8-positions of the naphthalene rings. Sum. 36 is a more powerful conductor than Sup. 36, because the amino (benzene) groups are positively charged, a feature which enables the conductor atoms to be liberated at closer quarters to the protein particles. In B.N. 368 all the hydroxyl groups are negatively charged. Hexyl-resorcinol, phlor-butyro-phenone, and acriflavine are examples of antiseptics depending for their action upon a negatively charged methyl group. Aspirin and atophan are examples of antiseptics with a positively charged carboxyl group. The best examples of antiseptics functioning through positively charged sulphonate groups are Sup. 468 and Sum. 468. The most suitable negatively charged antiseptic is contra-mine, which depends for its action upon a negatively charged sulphur atom.

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stain was sufficient, provided the film was unmounted. Next it was learnt that euparal has a reputation for showing up granules better than does balsam. Now, euparal has a lower refractive index than balsam, and air an index lower still. Possibly this explains why granules invisible in balsam can be seen in air. But what matters is that the plan of examining the smear unmounted works well in practice, for the corpuscles to be recognized can readily be identified. It is not claimed that by this practice *abnormal* cells in the blood can with certainty be differentiated, but it is claimed that by it a rough test of proved clinical utility can be easily, quickly, and cheaply made.

A dozen slides serve indefinitely. When done with they are placed in a small vessel containing a thick mixture of soap and water, boiled for a minute or two, rinsed in hot water, dried and wrapped in a long strip of paper ready to serve again.

An electric microscope lamp is another time-saver. One which answers admirably is made by cutting a round window in a cylindrical tin, punching some ventilating holes in the back, and suspending a frosted electric bulb, with switch, from the lid. A cardboard shade can be added.

Three estimates are made from the film. First, the total leucocyte count; secondly, the differential count; and, thirdly, the polynuclear or Arneth index.

The leucocyte count.—For this a hundred different fields distributed over the slide are examined and the number of white cells in each noted. Thus, the average number of cells per field is arrived at, and is compared with the average number found by experience in films of normal blood. This number, varying with different microscopes, will be round about two. The process is somewhat tedious, but after a little experience a general survey of the film, without actual

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$\frac{1}{8}$ in. in diameter, i.e. not too big. The blood is spread on this slide by a spreader made from a second slide, the corners of which have been ground down to steep knife edges. The spreader, whose end is thus narrower than the first slide, does not draw the blood beyond the edges of this, while the spreader's chamfered corners prevent the blood from heaping up along the edges of the smear. The air-dried film is folded in paper for transport.

Arrived home, the slide is stood upright in a small covered jar containing a saturated solution of corrosive sublimate in tap water. In this it remains for five minutes at least—how much longer matters little. This fixes the blood to the glass.

The slide is now washed gently under the tap and laid flat, say across a small ointment pot, standing, for cleanliness, in a porcelain developing dish. On to it, through a small filter and filter paper, is poured the stain, made by dissolving a small saltspoonful of commercial methylene blue in a four-ounce bottle of tap water. The stain is allowed to act for from five to ten minutes (again delay in stopping the process matters little), and gently washed in tap water for about half a minute, till most of the colour has gone. It is then drained, blotted, dried by waving in the air, and is ready for examination.

A dry $\frac{1}{8}$ in. objective is used in the microscope, with a small substage diaphragm. Closing down the diaphragm is essential, and the smaller the opening the better will granules be distinguished. A ground-glass slip is used beneath the slide—it improves definition. It is in examining the film unmounted that the technique is most unorthodox. In the first instance this was done purely to save time. But it was soon realized that eosinophiles were readily recognizable in air without eosin staining, while in balsam they were not, and that, therefore, for rough clinical work, a single

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counting, will show whether a marked leucocytosis or leucopenia is present.

The differential count.—For this 200 beans or other counters are placed in one bowl and a row of other bowls set out, one for each class of cell to be observed. As a cell is identified, so a bean is dropped into the appropriate bowl.

The polynuclear count.—Polymorphs are regarded as being of five types: Type I with undivided nuclei, Type II with nuclei in two parts, Type III in three parts, Type IV in four, and Type V in five or more parts. Five bowls are taken and fifty counters prepared. As a polymorph is seen, its type is determined and a counter dropped into the appropriate bowl. Finally the number of counters in each bowl is multiplied by one, two, three, etc., according to the number of nuclear lobes for which the bowl stands. The numbers thus obtained are added together and divided by fifty. This gives what is called the "weighted mean," normally about 2.70. Roughly speaking, the lower the weighted mean the greater the strain on the blood-forming organs, and a mean below 2.40 is said to be strongly suggestive of microbic infection.

	Type I	II	III	IV	V	Weighted mean
Normal count ..	8	8	27	5	2	2.70
Abnormal count ..	22	19	8	1	0	1.62

Abnormal figures like the latter are spoken of as a deflection of the count to the left.

While the smear is under examination look-out should be kept for unusual types of cell. Red cells may be of different sizes and shapes, and possibly nucleated forms may be noted. Paucity, or the reverse, of platelets may be apparent. Eosinophiles show up very distinctly owing to their large, highly refractile granules,

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which dot dark or bright as the focus is altered. Mast cells dot even more brilliantly, and can generally be differentiated. Türk cells, myelocytes and premyelocytes are recognizable, but certainly with less ease than when more elaborate methods and greater magnification are used. The proportion of underdeveloped and primitive cells in the blood is some index of the vulnerability of the patient to disease.

The kind of findings which may be helpful clinically, from their common occurrence in disease, are set out briefly below:—

Abscess.—Leucocytosis with high polymorph percentage (80+) and deflection to the left.

Appendicitis.—Early leucocytosis (polymorphs 75 per cent. +) gradually increasing if abscess forms. Or, absence of leucocytosis but with marked shift of the polynuclear count to the left, if perforation and general peritonitis have occurred.

German measles.—Slight leucopenia, with a marked increase of Türk and plasma cells.

Hæmorrhage.—Red cells irregular in size and shape. Leucocytosis.

Intestinal worms.—Eosinophilia (7 per cent. +).

Pneumonia.—Immediate high leucocytosis, high polymorph percentage and shift to the left. Leucocytosis remaining high is favourable, but absence of this, with increasing drift to the left and appearance of primitive cells, is of evil omen.

Pregnancy.—A leucocytosis; this should not be forgotten.

Purpura and hæmorrhagic states.—Paucity of platelets.

Rheumatism, Fibrositis, Insanity.—Possibly a leucopenia. A relative increase of polymorphs would suggest a coccal invasion and direct attention towards

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the teeth, tonsils and urethra. A relative lymphocyte increase would suggest a bacillary infection, and focus attention on the bowel.

Scarlet fever.—Polymorph leucocytosis with increase in eosinophiles.

Tuberculosis.—Variable blood picture. But persistent drift to the left, with increase of monocytes, is suggestive. The polynuclear count is useful in assessing progress and ultimate cure.

Typhoid fever.—Early leucopenia with preponderance of lymphocytes. If perforation occur increasing polymorph leucocytosis begins at once.

Whooping cough.—Marked leucocytosis with high percentage of lymphocytes.

Smears showing almost all the features set out above have been examined by the technique described, which has been used several hundreds of times in general and small hospital practice. They have afforded much interest and not a little clinical help, but had the procedure involved been more exacting they would, under the circumstances, never have been made.

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The Rapid Reduction of High Blood-Pressure in Acute and Dangerous Cases.

By A. GRAHAM-STEWART, M.B., CH.B.

Late Honorary Physician to Lawn House Hospital, Margate.

THERE are certain cases in which acute exacerbations in a persistently raised arterial pressure seriously threaten the life of the subject. These exacerbations—as, for example, after exertion or an acute emotional phase—are almost certainly the direct cause of many cerebral hæmorrhages. The state is therefore one that calls for immediate and drastic treatment if imminent catastrophe is to be averted. Degenerate cerebral vessels do not easily stand an unnecessary and superimposed strain of 50 or 100 mm. of mercury; these vessels have already been subjected to the prolonged strain of persistently raised arterial pressure—eventually to their detriment. When, therefore, the blood-pressure rises to a level 50–100 mm. Hg over and above a chronically high pressure, the patient is in acute jeopardy.

It will generally be found that most people with high blood-pressure—this remark is not intended to apply with equal force to frank cases of chronic interstitial nephritis—are frequently carrying, off and on, a superimposed “load” on the top of—for them—a normally high pressure. Various factors create these dangerous loads—toxæmias, excessive ingestion, defective elimination, insufficiency of rest (mental

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and physical), endocrine disfunction, and various psychological factors.

And it is this superimposed and dangerous load that requires active and drastic treatment; and it is also this load, over and above the normally chronic state, that we can control to a remarkable extent. By this control we can remove a patient from the brink of a precipice to a zone of comparative safety. When this extra load is discovered, rapid and energetic treatment is urgently called for; allowed to persist, catastrophe is often not long delayed.

The following case is typical of many, and is a good example of what can be done in the way of dealing with these dangerous exacerbations in high-pressure cases:—

Five and a-half years ago I was consulted by Mrs. B., age then 59, on account of severe epistaxis. The patient was much too stout, looked intensely toxic, and had a pressure of 220-120. The heart was not enlarged, the urine was normal, the vessels in very fair condition, the pulse-rate 72, and the fundi normal. Under regular observation and active detoxicating treatment the pressures came down to 160-95. This I found to be the normal for this patient, which it never exceeded in a series of numerous readings extending for a period of over five years. But with this pressure she kept well and free from symptoms referable to high pressure, and caused one no undue anxiety. The superimposed load had been removed with, of course, the disagreeable symptoms attending it—epistaxis, throbbings, dizziness, faintness and shortness of breath.

During these five and a-half years there have been ups and downs in the pressure—the tendency always being towards a rise. But the response to treatment was always good; and, while under regular observation and treatment directed to any undue rise, the figures were kept in the region of 160-170 systolic.

In November 1927 I was again consulted and I found a relapse to 220-115. The patient then left London for the country, and in February 1928 felt very ill and consulted a local practitioner. He found the systolic pressure was 250. She remained in bed for six weeks under treatment. At the end of this time the pressure had come down to 220, but not any lower. There she had treatment usually fairly effective, but no restriction was made in the ingestion of food, either as to kind or quality, with the exception that meat was not to be taken.

A short time ago she returned to London feeling very ill and I was again consulted. I found the figures were 260-135; pulse-rate 70. The symptoms were: tongue filthy and covered with a heavy thick coating; some mental agitation; a sense of fullness, pressure,

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and bursting in the head and marked giddiness; the expression was anxious, and slight mental confusion was observed. It was clearly obvious that here was an acute and dangerous state grafted on a chronic, but comparatively safe, condition. That her cerebral vessels, long subjected to a strain of from 170–200 mm. Hg, were now under a superimposed load of nearly 100 mm., placed her life, in my view, in a state of acute jeopardy. A cerebral vessel bleeding with 260 mm. behind it is not likely to stop at anything but a serious and almost certainly fatal hæmorrhage. By active and fearless treatment it is, in my belief, in cases such as this where one may fairly claim to have averted a more than likely tragedy—it is a tragedy one has seen too often ever to feel safe. These cases respond uniformly well to treatment; but they must be under regular observation, and they must obey the rules laid down if the pressure is to be kept within reasonable bounds; otherwise they will get these exacerbations, many of which are due to injudiciousness on the part of the patient.

That great medical genius, the late Sir James Mackenzie, once said to me: “We know nothing about high blood-pressure—and less about the treatment of it.” One has often wondered what he quite meant by this, because, in the type of case now being described, one cannot help feeling that a lowering of pressure by something in the region of 100 mm. is surely often to avert an acutely impending catastrophe. So long as this patient was under regular observation and adhered to the rules laid down, her pressure could be kept within quite moderately safe grounds.

TREATMENT.

1. *Physical Rest.*—The patient was put to bed in a nursing home—the treatment must, of course, be carried out in bed, but a nursing home is not imperative.

2. *Psychological Rest.*—As all these cases—especially when they get cerebral symptoms such as fullness and pressure in the head and, more especially still, giddiness—begin to have visions and dreads of “strokes,” the first step is to do one’s best to get rid of this idea by reassurance: not always an easy matter when one knows in one’s own mind the risks being run. But reassurance must be established, hope and cheer given,

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And it is this superimposed and dangerous load that requires active and drastic treatment; and it is also this load, over and above the normally chronic state, that we can control to a remarkable extent. By this control we can remove a patient from the brink of a precipice to a zone of comparative safety. When this extra load is discovered, rapid and energetic treatment is urgently called for; allowed to persist, catastrophe is often not long delayed.

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and toxæmia (the underlying cause in many cases) and prolongs the symptoms. So that no relaxation of this rule should be permitted until definite results have been obtained. For several weeks the diet should be as sparing as possible and should consist of carbohydrates, fruit and vegetables.

4. *Drugs*.—Calomel is given for two or three nights running—an eighth of a grain every half-hour for eight doses—and is followed in the morning, and thereafter every morning, by a mixture of magnesium and sodium sulphate sufficient to produce a genuine catharsis; it is quite ineffectual unless a dose sufficient to produce a really watery motion is given. Had I to rely on one drug for the reduction of these pressures I should invariably choose an efficient dose of these combined salts. Not only are they aperient but antitoxic also; their effect in lowering these pressures is one of the most certain things in medicine. There is no more effective weapon against the advent of cerebral hæmorrhage.

Almost equally important is the use of sodium bromide. Fifteen grains are given three times a day for a week. This has an excellent sedative and steadying effect and can rarely be dispensed with. To this is added seven to ten grains of ammonium hippurate, a mild, safe and effective drug and, in my opinion, all too little employed at the present day.

On account of the dangerous height of the pressure (260 mm.) and the risk to the vessels, two of Messrs. Parke, Davis & Co.'s "Hypotensive" tablets were given three times daily to hasten the lowering process. These tablets contain lithium hippurate two grains, sodium nitrite one grain, and nitroglycerin 1/200th of a grain, are mild and yet effective, and do not produce any disagreeable symptoms.

As an alternative to this, a very good prescription is: Sodium nitrite $\frac{1}{2}$ –2 grains, ammonium hippurate

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or the pressure will remain up. Any hesitation in the medical man, any grave faces, or any hint of even the possibility—or of the averting—of a stroke, and the agitation and anxiety produced in the patient's mind will nullify one's best efforts. That is the first and most essential step: all mental anxiety must be allayed in a very definite and confident way. If we know we are dealing with an exacerbation—a load—we can reassure with greater confidence. It is not the chronic nephritic who gets this mental perturbation through the knowledge of having high pressure; it is the toxic, nervously hypersensitive individual who is conscious—though not able, perhaps, to express it—that a menace has come; that things are not as they should be; and that something has happened on the top of what was before. These cases have to be handled with tact and with firm reassurance. "Blood-pressure" has an ominous sound in the mind of the layman; the very term should be avoided as much as possible, and figures should be withheld as far as one possibly can; they can only mislead the patient. In this case confidence and reassurance—perhaps on account of previous recoveries—were soon restored.

3. *Diet.*—It was obvious that this patient, though avoiding actual meat, had been most generous in the ingestion of food. And so it is with many of these cases. One is ever reminded of the truth of Sir William Osler's saying, that over-eating is one of the greatest factors in the production of hyperpiesis.

No ordinary food at all was given for over a week. The patient was allowed grape fruit and its juice, oranges and their juice, in quite large quantities, plenty of water and two cups of weak tea in the day. Hunger was absent. It is quite useless to allow a little of this, that and the next thing; this merely hampers efficient elimination, encourages intestinal putrefaction,

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condition where a grave load is superimposed on a chronically high pressure.

Such added loads threaten the life of the individual—severe and possibly fatal hæmorrhage being the risk run.

These states are amenable to dramatic improvement on the form of treatment described.

After reduction, by pursuing a modified form of treatment, such cases can be kept in a zone of comparative safety. But regular supervision and observation are necessary.

The production of a blood-pressure neurasthenic has to be borne in mind and carefully avoided.

In my experience, venesection is of little and of brief value. It will reduce the pressure some 10 mm. or so, but it fails to get at any of the underlying causes. And herein its failure and its temporary effect appear to me to occur, in that it treats—and that not very effectively—a symptom and not a cause.

Finally, if there should be little or no response to the treatment described, it is more than likely that we are dealing with a chronic interstitial nephritis; and the distinction—early on, at any rate—is not always as simple as the textbooks would have us believe. Yet in this differentiation we have enormously advanced by being able to get an estimate of the functional activity of the kidneys by means of the urea concentration test and the estimation of the blood-urea.

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7-10 grains, sodium bromide 10-15 grains, spirit of chloroform 10 minims, collosol iodine (Crooke's) 1 drachm, and distilled water to one ounce. This is given three times daily after food and well diluted.

On account of the presence of known and long-standing intestinal toxæmia in this patient and the offensiveness of the motions (and this should always be part of the routine treatment) intestinal detoxication was assisted by giving ʒiii of liquid paraffin in the day, in divided doses, and ʒss . of kaylene saline twice daily. The latter is an effective adsorbent of intestinal toxins.

After a week of this treatment the figures were as shown on the chart, 170-100—a reduction of 90 mm. systolic and 35 mm. diastolic. All subjective symptoms had, of course, disappeared, and the patient was bright and well.

It might be thought there would be a reaction with a drop of nearly 100 mm. in a week. There never is if one is dealing with an abnormal load on the top of a chronically high pressure—only a feeling of well-being. Once reduced and stabilized, if certain precautions are taken and rules are adhered to, the lowered level may be maintained.

It is interesting to note that after a week of this treatment the heavy furred tongue became quite clean. I am convinced that this was entirely due to the diet as no other form of treatment had ever cleaned the tongue before. The patient belongs to the school that believes that "to keep the strength up" more and more fuel must be added; and this is what had been happening. There is nothing more difficult than to get this idea out of some people's heads; it seems to be inborn.

CONCLUSIONS.

Many cases of chronic hyperpiesis develop at times, secondary to such states as alimentary toxæmia, deficient elimination, and psychological unrest, a

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Savoy; vines grow everywhere with vigour, and pomegranate trees, almond trees, fig trees and olive trees abound in the neighbourhood.

A town so frequented by visitors—over 30,000 come each year—has had its public health carefully guarded. The water supply, derived from the springs in the mountains and the depths of the lake, is good; the streets are clean and regularly watered. The chief springs from which the waters are taken are in the Square, and very picturesque it is. Chairs and tables are arranged beneath the shady trees, but there is no covered pavilion there, so in wet weather the kiosk at the *source* is rather small for the crowd. The season is not, however, usually a wet one, and the open-air life is very much the vogue. There are two casinos, lying between the railway station and the baths, surrounded by charming gardens, where concerts are given twice daily, and during the season there are many other entertainments, performances of opera, the usual “battle of flowers” beloved of French spas, the races and so on; there is now an eighteen-hole golf course, while excursions around the lake and into the glorious and varied country of the French Alps are very popular with visitors.

Spa treatment at Aix-les-Bains has been known since Roman times, and a Roman arch graces the Square. There are two springs, the waters of which contain a small percentage of sulphur, lime and other salts; one spring is about two hundred yards from the other, and together they give a volume of five million litres a day at a temperature of 44° and 47° Centigrade (112° and 116° Fahrenheit) respectively. The fact that the springs emerge on an incline enables the waters to be distributed in the baths at different pressures, and the volume of the waters allows an unrestricted quantity to be devoted to each treatment. This is one of the chief advantages of Aix-les-Bains, as many spas have

Aix-les-Bains as a Health Resort.

By LENNOX WAINWRIGHT, M.D., M.R.C.S., L.R.C.P.

AIX-LES-BAINS, in Savoy, is a spa whose merits have never suffered from the fickleness of fashion. I have been going there and sending patients there for over thirty years, and it has occurred to me, as it is recorded by every gossip writer that the Prime Minister of this country goes regularly to Aix-les-Bains for his annual "cure," that practitioners might like to know something at first hand about this spa and the methods practised there.

Aix-les-Bains is about 580 kilometres from Paris, or nine hours by train, on one of the main lines into Italy; London is about sixteen hours distant by express train. It is situated at an altitude of 846 feet in a beautiful valley overlooking Lake Bourget, and the wooded heights give a picturesque setting for the gem at their feet. Open to the north and south-west, it is free from winds and heavy storms; and though the clouds on the adjoining mountains may sometimes look threatening, yet Aix will be free from the wind and rain, and is sheltered from all sudden changes in temperature. The height of the Aix "season" is in July and August, but it is an agreeable place to stay in at almost any season of the year. The climate is peculiarly its own, rarely too hot, seldom too cold, and always refreshing in the evening; singularly dry and free from damp mists, Aix possesses the elements for improving the circulation and giving rest to the body. The vegetation resembles that of the south of France rather than that of the Alps, as one might expect in

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to those of a mud bath, but has the advantage of being cleaner and more pleasant.

The cure at Aix, when properly carried out under the medical balneologists who practise there, is very thorough and is of the greatest value in the treatment of the following ailments: toxæmic rheumatism, chronic rheumatism, gout; periarticular thickening, synovitis and any form of stiff joints; neuritis of all kinds, muscular rheumatism, fibrositis and the neuralgias associated with the various forms of rheumatism. Old articular gout and joint affections which have been produced by injury and prolonged inflammation are specially indicated for treatment at Aix.

Marlioz.—The pleasant little spa of Marlioz, which is only a few minutes' walk (about one kilometre) from Aix-les-Bains, should not be forgotten. Being so close it is quite easy to take the treatment when staying in Aix. The waters at Marlioz are cold, alkaline and highly sulphurous (much more so than the waters at Aix), and contain a certain percentage of iodine and of bromine; in addition, they are radio-active. When freshly drawn they have, however, scarcely any odour of sulphur and are not unpleasant to drink. They are employed chiefly in the form of douches and inhalations for the treatment of diseases of the nose and throat and of the respiratory organs, and in asthma and hay fever.

The two inhalation halls are very comfortable, and patients, seated at their ease, inhale the vapours which are vaporized from a central fountain. The hot vapour is also most effectual in relieving the pain of gouty and rheumatic limbs. Surrounding the baths is a beautiful old park of sixty acres containing well-wooded walks, varying in elevation, where the graduated exercise treatment, which I have found most valuable in cases of heart disease and of obesity, can be carried out.

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to be careful of the supply of their therapeutic waters, while Aix can afford to be extravagant in their use.

The method of treatment which has made the reputation of the spa is the massage-douche or "Aix douche." This is a most effective combination of massage and douche, given by two operators, the patient being seated on a wooden bench in a warm room. The patient's whole body is kneaded and rubbed under what may be described as almost a torrent of hot sulphur water; every joint and muscle is relaxed by this warm massage-douche and the capillary circulation is thoroughly renovated. This part of the treatment lasts for about six to eight minutes, after which a short hot, cold or, preferably, Scotch (hot and cold alternately) douche is given, with a striking or a shattered jet. The patient is then wrapped up in a *maillot*—a woollen bath-gown or blanket—and taken at once to his warm bed in the covered sedan palanquin which is peculiar to Aix and is essential to proper treatment. Sometimes the patient goes for a walk after the treatment, but in my opinion all patients who take the sulphur baths should be taken straight home in the special sedan chair and rest in blankets. Most of the spa physicians at Aix insist on this, and it is only those patients who ignore this advice who catch cold and blame the baths. For the bathers who have local treatments and do not need the sedan chairs the hotel buses are sent at frequent intervals.

The sweating treatment, *sudation*, is often combined with the massage-douche treatment; it is carried out either in hot, moist vapour baths or, preferably, in Berthollet cabins (so called after their inventor, a Savoyard chemist), the patient sitting in a sort of box with his head outside, his body being bathed in hot, moist, natural vapour, which may be directed on to the parts especially requiring treatment by *cornets* or tubes. This method gives results somewhat similar

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the process of natural cure is, therefore, a fibrous union with the constant liability to relapse. We have not yet succeeded in evolving a technique by which an ideal posterior ankylosis can be secured; the popularity of the methods of Hibbs and Albee indicate that these have most closely approached the ideal.—(*Edinburgh Medical Journal*, March, 1929, p. 133.)

The Treatment of the Toxæmia of Pregnancy.

H. A. Miller and D. Ben Martinez publish their experience of the treatment with liver extract of the toxæmia of pregnancy. Of 225 consecutive patients treated, all of whom can be classified as in the pre-eclamptic group, only four developed convulsions; of these cases 101 were mild, 95 of moderate severity, and 59 severe. As would be expected in the treatment of any condition, the response varied with the severity of the toxæmia; but even in the severe cases some improvement occurred without supplementary or symptomatic treatment, while in the moderately severe or mild cases some were returned to a practically normal state. Of 43 consecutive patients with eclampsia, only three died, a mortality of 6.9 per cent. The value of the method of treatment appears evident, but the authors do not consider it will be conclusively proved until a larger number of consecutive cases have been treated.—(*Journal of the American Medical Association*, February 23, 1929, p. 627.)

The Treatment of Infantile Diabetes.

M. Weil and G. Mouriquand state that insulin should not be employed in cases of infantile diabetes before it has been ascertained that the glycosuria can be controlled by dietetic treatment. When, however, insulin must be employed, it should be given in doses of ten units per day, though in severe cases it may be necessary to raise this daily dosage to 30 or 40 units. The injection should be made intramuscularly and given one hour before food. The diet should include a moderate amount of carbohydrates. In addition, 10 to 15 grains daily of bicarbonate of soda should be prescribed.—(*Journal des Praticiens*, March 9, 1929, p. 158.)

The Effect of Cholesterin on the Growth of Hair.

H. Krichel considers that the loss of hair frequently encountered in seborrhœic conditions of the scalp is due to faulty metabolism of fats, whereby excessive quantities of abnormal forms of fat are excreted by the sebaceous glands which cause destruction of the hair follicles. He discusses the abnormal growth of hair which results from excessive activity of the suprarenal glands and suggests that, as these glands contain large quantities of cholesterin fats, cholesterin constitutes the deficient factor in seborrhœa. By giving cholesterin in loss of hair associated with this condition, he argues that pathological fats will cease to be formed; whereas in the routine method of treatment, which is to give lotions and pastes calculated to dry up the excessive secretion, these merely act as a stimulus to the further production of abnormal fats. Cases of seborrhœic alopecia and of severe dandruff have been treated by cholesterin by

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The Treatment of Malignant Bone Tumours.

V. Putti, discussing malignant bone tumours, is of opinion that surgical intervention remains our sheet anchor in their treatment. He has had no experience with radium and a very limited one with Coley's toxins. He has used X-rays in association with surgical treatment, and also as the only method in dealing with inoperable tumours. He has observed the great value of radiation for the relief of pain, especially in diffuse sarcomata. He has gained the impression, however, that in some cases radiation hastened the formation of metastases in the case of soft sarcomata, more especially the endotheliomata. Perhaps, in view of their great sensitiveness to X-rays, these tumours could be cured if they were treated early with intensive doses and a wide field of exposure. In osteogenic sarcoma the author has had some rare successes with tumours of the fibromatous type, but no cure with the periosteal, subperiosteal or telangiectatic. The few successes in the treatment of osteogenic tumours which his statistics show represent cases treated by amputation or disarticulation. As there is no means of judging how much radiation immediately after the amputation contributed to the success, Professor Putti cannot give definite reasons for the results.—(*Surgery, Gynecology and Obstetrics*, March, 1929, p. 324.)

The Treatment of Tuberculosis of the Spinal Column.

J. Fraser, reviewing the pathology, symptomatology, and treatment of tuberculosis of the spinal column, observes that this disease is one of the most serious and difficult of surgical problems. The ideals that must underlie local treatment are: (1) Fixation of the affected region until the process of healing is complete; (2) the limitation of the degree of the angle of inflexion; (3) the avoidance, if possible, of the complications of cold abscess formation and paraplegia. Between the last two statements there is a corollary which it is important to recognize—that it is inflexion as a mechanical force which is responsible for the dissemination under pressure of the caseous debris; in other words, for the migration of the abscess. The treatment of Pott's disease is divided into two classes: (a) Non-operative or recumbent; (b) operative. Non-operative treatment consists in keeping the patient in the recumbent position on some such appliance as the Bradford frame for a period varying from one to three years or even longer, hoping that during this time the disease will become arrested, and that a system of fibrosis, together with new bone formation, may envelop and virtually encyst the disease. The disadvantages of this method of treatment are the length of time demanded by it, that some degree of kyphosis is inevitable, and as the vertebral bodies do not readily form new bone

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quiescent stage. In their opinion many cases have been weathered through the acute stage and lost by lack of judgment in dealing with the convalescent and the quiescent stage. Except where there are retained secunderies, and persistent loss of small amounts of blood, the authors prefer to give a short gas anæsthetic and completely remove the secunderies with a sponge-holder and swab the uterine cavity with a sponge saturated in 5 per cent. mercurochrome. There are thus two things accomplished: first, hæmostasis, and second, where there are infected retained secunderies the temperature usually subsides quickly. The authors condemn absolutely the use of the curette in these cases. The head of the bed is elevated and ice-bags applied to the lower abdomen; fluids, food and fresh air are essentials. If the patient is unable to retain large quantities of food given by the mouth, fluids are given either by hyperdermoclysis or in the vein; the authors prefer the mutas drip, alternating with 5 per cent. glucose and saline, 1,000 c.cm. each; it is not uncommon to allow this drip to run for three or four days. Medication plays a very small part in the treatment of puerperal infection; narcotics are given only to make the patient comfortable. Intravenous mercurochrome, beginning with 10 c.cm. of 1 per cent. solution, repeated daily up to the maximum dose, has apparently helped in some extreme cases. The patient should be examined frequently, keeping in mind the possibility of pelvic abscess, arthritis, pneumonia, and other complications.—(*New Orleans Medical and Surgical Journal*, March, 1929, p. 619.)

Chickenpox Complicated by Acute Nephritis.

E. Rankin Denny and B. M. Baker, junr., report an interesting case of chickenpox complicated by acute nephritis, associated with hæmolytic streptococcal infection of the tonsils. Nephritis rarely occurs during the course of chickenpox, and in this instance it came on during the relatively infrequent hæmorrhagic type of this eruptive disease. Without a careful bacteriological study of the fauces and the urine, the organisms isolated from which had common cultural characteristics, it might have been supposed that the hæmorrhagic nephritis was in some way directly associated with the attack of varicella. Though it seems probable that the organisms must have reached the kidneys by way of the blood stream, it is of interest to note that a blood stream infection was not demonstrable by blood culture during the early stage of the streptococcal infection.—(*Bulletin of the Johns Hopkins Hospital*, March, 1929, p. 201.)

The Diagnosis of Disease of the Gall-Bladder.

W. L. Ritchie and I. M. Rabinowitch publish a comparison of the value of various laboratory tests for the detection of disease of the gall-bladder and its passages, and come to some interesting conclusions. The authors have found the following tests to be the most useful and practical and now form part of their routine: Fat partition of the stools; estimation of the urobilinogen content of the urine; estimation of the sugar content of blood in the fasting state; Van den Bergh reaction; blood-sugar time curve; X-ray

mouth with encouraging results.—(*Deutsche Medizinische Wochenschrift*, February 15, 1929, p. 275.)

The Diagnosis of Cancer of the Stomach.

P. Duval and J. C. Roux observe that, although radiographic examination of the stomach has proved of great help and has given facility and precision to the diagnosis of cancer of the stomach, yet there are certain cases of early cancer of the stomach which are not shown in a radiogram. They publish three illustrative cases, in which the X-ray examination showed apparently a normal stomach or a small ulcer of the stomach, yet in each case at operation there was found a large neoplasm of the stomach, and in one case it was so large as to be inoperable. The authors insist, therefore, that in cases where a neoplasm of the stomach is suspected on clinical grounds (especially when hydrochloric acid is deficient and there is blood pigment in the stools), operations should not be postponed because X-ray examination is negative.—(*Archives des Maladies de l'Appareil Digestif*, January, 1929, p. 102.)

The Treatment of Influenza in the Recent Epidemic.

L. Stein has found during the recent epidemic of influenza that camphor is a valuable drug, not only when there is evidence of cardiac complications, but also in those cases in which frequent cough is troublesome and when there is excessive secretion of mucus in the bronchi. He maintains that broncho-pneumonia is less likely to develop in patients treated in this way. The camphor is given in powder form together with quinine and aspirin:—

R	Camphoræ	-	-	-	-	0.05 g.	(grs. $\frac{3}{4}$)
	Quinin. Hydrochlor.	-	-	-	-	0.20 g.	(grs. iij)
	Acid. Acetosol.	-	-	-	-	0.30 g.	(grs. ivss)

Sig.: Two powders to be taken daily.

As regards the use of alcohol in influenza, Dr. Stein is of the opinion that this should be given early in every case, as it not only acts as a cardiac stimulant but renders the patient less miserable in the early stages of the attack.—(*Weiner Medizinische Wochenschrift*, February 23, 1929, p. 292.)

The Value of Tar in the Treatment of Eczema.

F. Blut and B. Hajos bring forward evidence to show that non-irritant coal-tar preparations form one of the most useful methods of treating chronic eczema. They recommend a combination of purified tar with camphor and sulphur which is called sulphanthren. This may be used alone as an ointment or added to the zinc oxide ointment usually employed. In acute cases where there is much œdema, tension and pain, tar ointments should not be used until the œdema has subsided.—(*Medizinische Klinik*, February 15, 1929, p. 271.)

The Treatment of Puerperal Infection.

T. B. Sellers and J. T. Sanders suggest that the treatment of puerperal infection should be considered under two heads: first, the acute, fulminating stage; second, the convalescent and the

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We must stop talking about *ulcer*, without a qualifying adjective, designating either duodenal ulcer, meaning a benign lesion, or gastric ulcer, meaning a possibly malignant lesion. For simple duodenal ulcer gastro-enterostomy is the most satisfactory operation and, except in unusual cases, extensive resections cannot be recommended. Local excision, however, is an operation of merit. Gastric ulcer should be treated as a pre-cancerous lesion, and should be excised. The type and extent of the operation depends on the individual case. The medical practitioner and the surgeon should confer over every case, particularly the gastric ulcer cases, to decide just what should best be done.—(*New England Journal of Medicine*, March 21, 1929, p. 575.)

The Value of Streptococcus Antitoxin in Puerperal Fever.

A. F. Lash has made a study of the therapeutic value of a new concentrated streptococcus antitoxin in puerperal fever, basing his conclusions on the results in 57 patients in various stages of puerperal fever who were given serum-therapy, while 13 control cases received no serum. He concludes that the puerperal fever streptococcus antitoxin possesses specific value in acute endometritis with septicaemia due to the hæmolytic streptococcus; there is also a favourable response in the non-hæmolytic streptococcus infections. The potency of the serum as determined by toxin neutralization (Dick method) and by comparison with that of scarlet fever antitoxin of known therapeutic value shows a titre equal to that of the scarlet fever antitoxin. The antitoxic power increases with further immunization of the animals. The larger amounts of serum used in the earlier work on this subject were probably superfluous, as the only index then used for the repetition of the dose was fever, rather than the condition of the patient. To use fever as the only guide for serum-therapy may be misleading, since the antitoxin may overcome the toxæmia and thereby allow the leucocytes to overcome the streptococci, without causing an immediate drop in fever. In spite of the hyperpyrexia, the general improvement of the patient influences the defence mechanism favourably, permitting thereby the localization of the infection to the pelvis.—(*American Journal of Obstetrics and Gynecology*, March, 1929, p. 297.)

The Treatment of Tuberculosis *Sanocrysin*

L. Bernard and C. Mayer report their extends over four years, with Sanocrysin in culosis. They come to the conclusion that does not possess the specific action upon tuberculosis first attributed to it, yet undeniably it does upon the course of the disease, particularly in a series of 142 cases of tuberculosis, 43 per cent with the administration of Sanocrysin, as the disease, the lowering of the temperature, and the X-ray appearances.—(*Gazette des* p. 467.)

visualization of the gall-bladder with the aid of phenoltetraiodophthalein. Though the blood-sugar time curve appears to be slightly more reliable than the X-ray, both should be made use of in each case. Of 28 cases with reports of blood-sugar time curves and X-ray both positive, all had gall-bladder disease; of nine cases with positive blood-sugar time curves and negative X-rays, in eight there was gall-bladder disease; in three cases with negative blood-sugar time curves and positive X-rays, the final diagnosis agreed with the X-ray reports. In a total of 43 cases, the disease was detected pre-operatively by chemical examination in 38, an incidence of 88 per cent.; the X-ray findings were corroborated in 34 cases, an incidence of 74.4 per cent. The blood-sugar curves present further evidence of the high incidence of pancreatitis in cases of gall-bladder disease. Such individuals are potential diabetics. In the last 10,000 admissions to the wards of the authors' hospital there were 204 diabetics, an incidence of about 2 per cent. Whereas, among the 300 cases with a diagnosis of cholelithiasis, cholecystitis or pancreatitis, there were 23 diabetics, an incidence of about 7 per cent. In other words, in the group of individuals with suspected disease of the gall-bladder and its passages, the incidence of diabetes was more than three times as great as for the hospital population as a whole.—(*Canadian Medical Association Journal*, March, 1929, p. 263.)

The Treatment of Ulcerative Colitis.

A. Bassler observes that ulcerative colitis begins almost always as a rectal infection and travels up the left side of the colon. This portion of the intestinal canal is within direct contact from the anus by solutions per anum. Even if caecostomy has been performed and daily injections employed, the lower canal should be treated from below. There are two procedures well worth employing. First, the nightly instillation of four ounces of the following suspension, as recommended by Dr. Landsman:—

R	Iodoform	-	-	-	-	-	8 parts
	Bismuth subnitrate	-	-	-	-	-	120 parts
	Olive oil	-	-	-	-	-	1,000 parts

Sig.: The suspension to be retained.

Secondly, the coating of the gut, every other day, through the proctoscope, with a half-and-half mixture of calomel and bismuth subnitrate powder, to which iodoform or some other antiseptic in powder form may be added.—(*Medical Journal and Record* [New York], March 20, 1929, p. 320.)

The Treatment of Gastric and Duodenal Ulcer.

R. H. Miller states that whatever may be the remote causes of peptic ulcer, the factor which must be given most consideration is the disturbance of balance between the acid stomach secretion and the alkaline duodenal contents. Any operation for ulcer must, to be successful, result in proper alkalization of the stomach contents.

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and published, which showed conclusively that the blood-vessel involvement in hydronephrosis is a complication and not a cause. The author's comment that local and regional anæsthesia has revolutionized the technique of cranial surgery and reduced its primary mortality, carries weight from the author's experience in this branch of surgical work. One is glad to note that, although he refers to local and regional anæsthesia in gastric work, he still acknowledges a use for general anæsthetics. The inclusion of adrenaline with the novocaine injection is a questionable advantage in the light of the most recent research. He has wisely given explicit instructions with regard to the preparation of the novocaine before injection; failure to produce anæsthesia is usually the result of a lack of knowledge of some part of the technique. We are glad to note the warning about infiltration of anæsthesia in the presence of sepsis. There is always a temptation to overload a work on so wide a subject as surgery. The author has not succumbed to this temptation; he has produced a well-balanced work in choosing between what should be included and what left out. We strongly recommend it to both students and practitioners as being easy to read, not too bulky, and full of up-to-date information. We congratulate the author on producing such an acceptable volume.

Handbook of Surgical Diagnosis. By CLEMENT SHATTOCK, M.D., M.S., F.R.C.S. Pp. 678. Edinburgh: E. & S. Livingstone. 15s. net.

WE are interested to see how an exponent of the art of teaching, such as Mr. Shattock, approaches his subject, shorn as it is alike of the data on which his conclusions are based and of the indications for treatment to which his logic should lead him. The work is subdivided into systems, and he prefaces his descriptions by short synopses of the morbid anatomy concerned. The section on bones is good, though necessarily involved. We note that he illustrates an example of sarcoma of a long bone with new formation parallel to the shaft, though in periosteal growths there is no reference to the severe pain commonly experienced early, and frequently leading to an erroneous diagnosis of neuritis. The section on the breast is straightforward. We do not think that among the ulcers of the mouth sufficient stress is laid upon the possibility of exact mimicry of cancer by tuberculosis, and in general we should welcome more information about the ways in which errors of diagnosis arise. Among nervous diseases he adheres to the widely discarded epicritic and protopathic areas of sensibility, and, dealing with pressure on the spinal cord, he gives nearly a page to lipiodol; we think that this space would be better applied to the cerebrospinal fluid changes, to which he devotes four lines, the last of which, dealing with cells, is inaccurate. The book is clearly printed and the index comprehensive. The illustrations comprise seventy-eight skiagrams, reproduced with varying success. The old terminology is used throughout. We congratulate the author on a small volume at moderate price which, in contrast with many expensive, profusely illustrated, but dilute compositions of the present day, contains an impressive mass of sound information plainly and definitely expressed.

Reviews of Books.

Surgery in the Tropics. By SIR FRANK POWELL CONNOR, D.S.O., F.R.C.S., Lieut.-Col., I.M.S., Professor of Surgery, Medical College of Bengal, Calcutta. (Churchill's Empire Series.) Pp. ix and 293. London: J. & A. Churchill, 1929. Price 12s. 6d.

ALTHOUGH it is true that tropical surgery includes every branch of surgery, there are certain aspects of surgery and various surgical diseases and complications which, being rare or unknown in temperate climates, require special knowledge and procedures. The author in this book attempts to meet these needs, and we think with conspicuous success. All the important tropical diseases are considered, and the treatment for any surgical complications is given, but in addition the appropriate medical treatment, if any, is indicated, e.g. in trypanosomiasis, leishmaniasis, leprosy, yaws, schistosomiasis, and dysentery. The two most important diseases requiring special surgical treatment, namely, liver abscess and elephantiasis, receive full and adequate consideration. But the book also includes a mass of information on all sorts of subjects, from prickly heat to snake bites. We also appreciate the many little—but important—"tips" that are given, such as the remarks on anaesthetics and operating garments, the use of electric fans for modifying the heat, the prejudices of natives, and the like. The book, which is profusely and excellently illustrated, concludes with an appendix with maps on the geographical distribution of some of the diseases of India.

The Art of Surgery. By H. S. SOUTTAR, D.M., M.Ch., F.R.C.S. Pp. 624. London: Wm. Heinemann (Medical Books), Ltd. 30s. net.

The author has chosen an attractive title for his work. It is good to emphasize the fact that surgery is an art. This is frequently forgotten. He has shown good judgment in leaving out operative details in a work meant for students. The marginal arrangement of the thumbnail sketches is an artistic notion, but, unfortunately, the standard of the drawings is not uniformly high. The wide margin offers a great temptation to the industrious student to add his own comments alongside the text. Perhaps Mr. Souttar has thoughtfully provided the space for this purpose. The prominence given to the headings at the side of the text will be of great convenience to students for revision. One is glad to note the high regard which the author has for the use of radium in carcinoma of the tongue; he is more restrained in his advocacy of the use of this substance for cancer of the breast, although he rightly says that brilliant results have been obtained from the employment of radium. It is a pity that an entirely new surgical textbook should perpetuate the old heresy of the abnormal blood-vessel as a cause of the disease. Three years ago a mass of evidence was collected

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Preliminary Treatment in Enlarged Prostate.

By SIR THOMAS CAREY EVANS, M.C., F.R.C.S.

Surgeon to the Hospital for Tropical Diseases, London; Assistant Surgeon to St. Paul's Hospital for Genito-Urinary Diseases; late Surgeon to H.E. the Viceroy of India.

IT is not the intention in this article to discuss the details of the operative treatment of the enlarged prostate, which should be left in the hands of those surgeons who devote their attention to this important branch of surgery; but the writer wishes to emphasize in THE PRACTITIONER that preliminary treatment before operation, when efficiently carried out by the general practitioner, whose duty it must be, plays a very important part in the ultimate success of the surgical treatment of the patient. In the majority of cases the general practitioner is the first to be consulted for this troublesome affliction, and it should be his aim to make a correct diagnosis and to obtain accurate and detailed information about the local and general condition of his patient, and, if operation is not obviously contra-indicated, to prepare the patient by preliminary treatment so that he may be in a fit state to undergo and withstand the operative procedure and derive the

Preparations, Inventions, Etc.

KAYLENE PRODUCTS.

(London: Messrs. Kaylene, Ltd., 7, Mandeville Place, W.1.)

We have received for examination samples of Kaylene, Kaylene-ol and Kaylene Saline. Kaylene is now well known to every practitioner as an excellent preparation of colloidal kaolin, which possesses in a high degree the power of adsorbing intestinal poisons, and so ridding the system of noxious substances produced in the contents of the bowel as a result of stasis, indigestible food and indiscretions of diet; we have found Kaylene to be of the utmost value in the treatment of severe cases of acute food poisoning, in which it is given freely and frequently without the addition of aperients. Kaylene-ol is an emulsion of Kaylene and Colonol liquid paraffin. This preparation is especially adapted for the treatment of cases due to intestinal toxæmia arising from stasis; the intestinal poisons are adsorbed by the Kaylene and, aided by the liquid paraffin, the stream of soluble toxins, incorporated in the solid particles, is deflected downwards, toxæmia being overcome and the mucous membrane soothed. The mechanical action in the large intestine converts the contents into a soft homogeneous mass, which is easily voided; no discomfort or seepage arises from its regular use. Kaylene Saline is a mildly aperient preparation combining the adsorptive properties of Kaylene with saline laxatives for the elimination of the intestinal content. It is in colloidal form and possesses great activity in the adsorption and elimination of noxious substances produced in the bowel as a result of intestinal stasis and indiscretions of diet. If kept dry, this preparation produces a slight effervescence when mixed with water, and is best taken as a saline draught first thing in the morning.

A MEDICAL CRUISE.

The well-known Belgian medical journal, *Bruxelles-Médical*, is organizing this year a cruise for medical practitioners and their families in the s.s. "Brazza," a motor-engined liner of 16,000 tons. The cruise will begin at Zeebrugge on July 13, and will then proceed to Norway, visiting Bergen and the Norwegian fiords, the Lofoden Islands and the Arctic Circle, the Faroe Islands, Lerwick and the Shetland Islands, Leith (for Edinburgh and the Scottish Trossachs), and returning to Zeebrugge, while an extension may be made to Bordeaux, the liner's port of registry. The minimum fares are £43 10s. 6d. first-class, and £20 5s. second-class. All communications should be made to the *Bruxelles-Médical* Cruise, 29, Boulevard Adolphe Max, Brussels.

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By SIR THOMAS CAREY EVANS, M.C., F.R.C.S.

Surgeon to the Hospital for Tropical Diseases, London; Assistant Surgeon to St. Paul's Hospital for Genito-Urinary Diseases; late Surgeon to H.E. the Viceroy of India.

IT is not the intention in this article to discuss the details of the operative treatment of the enlarged prostate, which should be left in the hands of those surgeons who devote their attention to this important branch of surgery; but the writer wishes to emphasize in *THE PRACTITIONER* that preliminary treatment before operation, when efficiently carried out by the general practitioner, whose duty it must be, plays a very important part in the ultimate success of the surgical treatment of the patient. In the majority of cases the general practitioner is the first to be consulted for this troublesome affliction, and it should be his aim to make a correct diagnosis and to obtain accurate and detailed information about the local and general condition of his patient, and, if operation is not obviously contra-indicated, to prepare the patient by preliminary treatment so that he may be in a fit state to undergo and withstand the operative procedure and derive the

best results from that line of treatment.

It has been stated that 10 per cent. of all men over the age of fifty are liable to be afflicted with an enlarged prostate. The causation of the condition is still obscure, among the factors attributed being general arteriosclerosis, chronic gonorrhœa and sexual excess, but no single factor has any definite relation to the condition. Both saints and sinners, celibates and libertines will be amongst the patients with enlarged prostates. The pathology of the disease, whether it be hyperplasia, hypertrophy, chronic inflammation or neoplasm, is still a matter of controversy even among experts.

We are all familiar with the usual symptoms, which are described in every textbook of surgery, such as frequency of micturition, especially at night time, a hesitation at the commencement of the act of micturition and possibly dribbling. Elderly patients frequently pay no attention to these symptoms, looking upon them as the natural accompaniment of advancing years and as a tribute to the excellence of their kidney excretion. Should the frequency become excessive, especially at night time, sleep is disturbed and there then begins a steady decline in the patient's general health.

The first indication of an enlarged prostate may be acute retention of urine, when sound judgment as to the best treatment is most essential. But an enlarged prostate, so long as there is no obstruction at the neck of the bladder, may not cause symptoms, and a small prostate may be the cause of serious prostatic symptoms. The symptoms depend entirely on the degree of obstruction, and this also determines the amount of the residual urine.

The patient may come, on the other hand, complaining of some symptoms which have no relation whatever to the prostate; hence it is always advisable, when a

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practitioner is consulted by an elderly man, to inquire about the frequency of micturition, how often he gets up at night, and to let him pass a specimen of urine, if possible in the practitioner's presence. This enables one to observe if there is any delay in starting the flow and also to note the size, force, and curve of the stream and any intermittency or dribbling. The colour, smell, and the presence or absence of visible pus, blood or phosphates in the urine should also be noted.

The patient should then be asked to lie down on a couch and the hypogastric region should be palpated and percussed for evidence of a distended bladder. When the bladder is not palpable above the pubes, the residual urine does not as a rule amount to more than 4 oz. The quantity of residual urine is determined next. The meatus is well cleansed and a moderate-sized gum elastic coudé or bi-coudé catheter is lubricated and passed gently. As soon as the prostatic urethra is reached, great care should be taken not to lacerate the mucous membrane, which will cause bleeding and later on possibly infection. The smaller catheters are more liable to cause damage than the medium-sized ones; therefore it is best to use an instrument of about No. 10-12 (English) size.

The residual urine is slowly withdrawn in a measure glass to determine the quantity, and this specimen is sent to the laboratory for a complete examination. In no case, however, should more than 10 oz. of urine be withdrawn, as the exact determination of any quantity over and above that amount is not of much importance. The danger of withdrawing too much urine from an over-distended bladder is very great. Any rapid decompression has serious results on the vessel walls of the bladder, ureters and kidneys. The delicate vessels in these structures have become used to the pressure and their thin and weak walls give way when

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settle the difficulty. A very big and soft enlargement may be due to sarcoma. In some cases, however, it is very difficult to differentiate between benign and malignant enlargement of the prostate.

The question of cystoscopy comes next, but as a rule this should be left to an expert urologist, because, in addition to the technique being somewhat difficult, the correct interpretation of the bladder appearances, as revealed by the instrument, requires considerable experience in judging the actual conditions seen.

There is never any urgency in dealing with prostatic enlargement, except when there is retention of urine; this is a condition that must be relieved, and the general practitioner, in the absence of more skilled aid, has frequently to take on this responsibility. He must use his judgment as to the amount of urine in the bladder. To relieve rapidly a bladder that is distended to the umbilicus will do more harm than good. In general, the best thing is to use a catheter, as already described above, and withdraw the urine *slowly*. A No. 12 coudeé or bi-coudeé gum-elastic catheter should be passed after the meatus has been thoroughly cleansed, and the anterior urethra gently irrigated with a 1 in 5,000 oxycyanide of mercury solution.

If the bladder is very distended, about 12 oz. should be removed every three hours, and then until the bladder is empty; then lavage of the bladder, with 1 in 5,000 oxycyanide of mercury or a 1 in 600 solution of meroxy, should be carried out. The constant presence of a catheter in the urethra sometimes gives rise to a urethritis or a periurethritis; this complication can be avoided by changing the catheter daily or every other day, and by washing out the urethra with a 1 in 5,000 solution of oxycyanide, which is non-irritating, before introducing a new instrument. In some cases the urine is foul and septic, or the urethra does not

the pressure is suddenly removed, causing profuse bleeding and even death. In addition, the kidneys may become acutely engorged causing suppression of urine, uræmia, and death. Sometimes cardiac failure may cause sudden death when the bladder is emptied too rapidly. If too much urine is inadvertently withdrawn, it should always be partially replaced by sterile water or saline. This partial replacement by sterile fluid should be done also when a distended infected bladder is washed out.

The next step is rectal examination. This is best carried out with the patient in the knee-elbow position. The prostate is more prominent in the rectum in this position and, besides, the finger can be pushed farther. A finger-stall or rubber glove should always be used. The size, shape, and consistency of the prostate should be noted and accurate information obtained. The practitioner must not be misled by the findings on rectal examination. The gland by the rectum may feel normal in size or even smaller than usual. In these circumstances enlargement of the medium lobe towards the bladder, a median bar or contracture at the neck of the bladder has to be considered. These points can only be settled by cystoscopy. On the other hand, the gland may be enlarged generally or the growth may affect only one or other lobe. In the majority of cases, however, the prostate is found to be definitely enlarged on rectal examination.

The consistence and surface of the gland are noted—whether hard or soft, smooth or nodular. A stony, hard gland or hard nodules in an enlarged gland, with disappearance of the posterior median groove between the two lobes and fixity to surrounding structures, especially to the rectum, should arouse more than a suspicion of carcinoma. Prostatic calculi may be felt as hard nodules, but as a rule they are tender to the touch, and in case of doubt an X-ray examination will

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of post-operative pneumonia. This dental treatment may take some weeks, but operation should not be performed until the teeth are healthy. The diet should be light and nourishing—care being taken to avoid foods which are likely to cause flatulence, particularly starchy and green foods. It is valuable to increase the vitamin-B content in the dietary, the simplest means being by giving such a preparation as Bemax; this has been found also to lessen the post-operative distension which causes much anxiety in elderly patients and is difficult to treat. Constipation should be carefully treated. Salines are apt to cause flatulence and are best avoided. It is most important that the post-operative distension of the large bowel should be prevented by thorough preliminary treatment of the bowels. Should the patient have bronchial or pulmonary troubles, every effort must be made to clear these up before deciding upon operation. Hypostatic congestion is an unpleasant post-operative complication. Massage and light exercises, if the patient can tolerate them, will help to preserve the general physical condition during this pre-operative period.

A patient may be considered fit for operation when his heart is compensated, his respiratory system reasonably healthy, his digestion good, and his bowels acting regularly and satisfactorily. In addition, his renal function should be estimated, at least one colour test being carried out. His blood urea should not exceed 40 mgms. per 100 c.cm., and his urine urea should be over 1·5 per cent. The success, then, of the operation and subsequent treatment will depend on the results of cystoscopic examination, on the renal tests, and, above all, on the general fitness of the patient, which can be brought about by efficient preliminary treatment in the hands of the general practitioner.

tolerate the presence of a catheter; in such cases it is essential to do a suprapubic cystotomy and start continuous lavage, again paying attention to the danger of suddenly emptying the bladder.

The kidneys must be flushed out and their working capacity increased. This is best done by giving large quantities of fluids such as barley water or imperial drink by the mouth; also by giving saline subcutaneously or per rectum if necessary. Diuretics, in the form of potassium acetate or citrate or theocin, may sometimes be useful. Urinary antiseptics, such as hexyl-resorcinol or urotropine (10 grains), combined with acid sodium phosphate (15 grains) if the urine is alkaline, may be tried. In certain cases, however, urotropine upsets the already weakened digestion, thus doing more harm than good. A reliable and harmless urinary antiseptic has yet to be found.

Before resorting, however, to this method of active water treatment, the condition of the heart should be watched. The heart muscle must be under the complete influence of digitalis before fluids are administered in large quantities, as they are liable to embarrass the circulation. It is important in any case to strengthen a weak or dilated heart and to compensate for any valvular lesion, and the best remedy for this is digitalis, which may be used as the tincture, as powdered leaves, or digitalin. A good method to "digitalize" the patient is to give him two grains of powdered digitalis leaves twice daily for three days and then diminish the dose to two grains once a day. During the treatment of kidneys by flushing, cardiac embarrassment must be guarded against by looking out for signs of oedema and for irregularity of the heart and pulse, these being useful danger signals.

It is most important to see to the condition of the teeth, and a competent dentist should undertake thorough treatment. The presence of carious teeth increases flatulent dyspepsia and may also be the cause

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of varying length, suggesting not so much a progressive change in the ear itself as a slow-poisoning of the cortical cells in the cerebral auditory apparatus, progress being due to increased toxic effects and stationary intervals to increased resistance. In comparatively early stages there may be brief periods of amelioration. (2) It is frequently connected with pregnancy as an apparent determining factor both of onset and of exacerbations. Pregnancy throws additional strain upon the body resistance and especially upon the digestive and elimination apparatus. (3) There is a strong hereditary tendency in otosclerosis. (4) Severe tinnitus, often intractable to local treatment, is frequently a first or early symptom, which also points to cortical irritation. (5) A minor point is the occurrence of migraine, a symptom of chronic intestinal intoxication, in about fifteen per cent of the cases. (6) The nature of the changes in the labyrinthine capsule is suggestive of those in rheumatoid arthritis, itself a result of chronic toxæmia. (7) The greater frequency in women, partly on account of their sexual functions, partly because of their greater liability to habitual constipation. (8) The accompanying symptoms of intestinal intoxication, present in all cases. The few cases of otosclerosis in girls of school age that have come before me in my official capacity at the L.C.C. have all been, as have also their mothers, the subjects of this condition.

Recent work upon chronic intestinal intoxication throws a flood of light upon the causation and course of otosclerosis, the most specially illuminating being that of J. E. R. McDonagh in his "Nature of Disease," Part II. (Heinemann, 1927). A brief summary is necessary here for an appreciation of its bearing upon the problem in hand. McDonagh has established the fact that chronic intestinal intoxication, probably one of the chief of the many disabilities attached to

The Problem of Otosclerosis.

By MACLEOD YEARSLEY, F.R.C.S.

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St. James's Hospital, Balham.*

THE problem of otosclerosis, by which I mean the condition described by Denker in 1904 in his well-known monograph and not the post-catarrhal stages of chronic middle-ear catarrh, is one which has baffled otologists for years. The reason probably lies in that limited outlook to which otologists are prone and which confines their attention too much to the sense organ in preference to the organism. This limited attention has, moreover, been concentrated almost entirely upon the changes found in the labyrinthine capsule, leaving the cerebral auditory centres unheeded; that is to say, the organ *by* which we hear has been neglected for that *with* which we hear.

In a paper presented to the International Otological Congress at Copenhagen in July, 1928, but which, owing to the plethora of material was taken as read, I drew attention to this problem and formulated a theory of otosclerosis which, owing to the difficulty of obtaining pathological material, is at present based upon clinical evidence alone. It is my intention in this article to give a summary of my conclusions, with the addition of a few remarks upon treatment and brief references to cases, considerations of space alone being responsible for not giving the latter in detail.

The salient facts resulting from some thirty to thirty-five years of observation of cases of otosclerosis may be put as follows: (1) The condition is insidious and progressive and tends to become stationary for intervals

from McDonagh (*loc. cit.*, p. 53) as follows: "Some degree of what may be loosely termed 'neurasthenia' is present in practically all the cases. The condition may show itself in general asthenia, lack of initiative, inability to concentrate, worrying over trifles; headaches, *petit mal*, epilepsy, and insanity. There is often some error of refraction, and congenital cupping of the optic discs (usually at the site of exit of the central artery of the retina) is not uncommon. The teeth are bad and the tongue is dirty, raw-looking, swollen and fissured. Nasal catarrh, sneezing fits, hay-fever, asthma, bronchorrhœa and bronchitis are common. The arms are hyper-extended and an angle is formed at the elbows, with the result that most of the patients when young were not experienced at throwing a ball overhand. The palms are usually clammy and the fingers show a varying degree of acroasphyxia. Most of the patients were afflicted with chilblains some time or other in their life. An alteration of the normal activity of one or more of the ductless glands is not uncommon. The pulse-rate is slow and arhythmic in early life and apt to be accelerated later. Extra-systoles may be encountered, but the heart as a rule escapes. In the majority of cases the blood-pressures are reduced. Chronic indigestion and either constipation or diarrhœa are complained of, and many of the patients have an abdominal operation at one time or another. The urine almost invariably gives a faint haze with the hydrochloride of di-methyl-*para*-amino-benzaldehyde. Most of the patients fail to go through life without some rheumatic and cutaneous manifestation. The rheumatism affects most frequently the fingers and toes and then the knees. Sciatica is not uncommon. The cutaneous troubles include infantile eczema, seborrhœic dermatitis, urticaria, the various forms of acne and psoriasis."

The significance of the eight salient facts noted above

civilization, is remarkably widespread. It causes disease because the growth of putrefactive organisms gives rise to proteolysis of the proteins introduced into the intestines in the food. These products of protein putrefaction are chemical substances which, when they reach the blood-stream, alter the normal chemico-physical state of the protein particles in the plasma, subjecting them to dehydration. The action, being a slow one, extends over a long period of time, hence no blood-picture peculiar to chronic intestinal intoxication can be obtained. McDonagh has, however, found a marked similarity existing between the blood-changes in intestinal intoxication, pathological pregnancy, and syphilis, and it is significant that both pregnancy and syphilis have been suggested as causes of otosclerosis. When the chemical substances resulting from protein putrefaction reach the blood-stream they cause the protein particles of the plasma to part with their various adsorbed constituents. The loss of electrons results in the reduction of the suspension stability of the red blood-corpuscles and the latter go into *rouleau* formation far more readily and sink in a test-tube more rapidly. Space will not allow of a full account of the changes which occur, and the reader is referred to the first chapter of McDonagh's work. Whatever the changes undergone by the protein particles, "the last act to be executed is precipitation in the *peri*-capillary lymphatics, capillaries or arterioles in the brain, kidneys or liver. The vessels in the brain are those most usually affected, either singly or together." In migraine, for example, it is in the *peri*-capillary lymphatics of the optic thalamus that precipitation occurs.

Every case of otosclerosis exhibits some or more of the cardinal signs of familial chronic intestinal intoxication, together with a marked degree of mal-co-ordination. The best summary of these signs may be quoted

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From the foregoing remarks, it will be noted that a definite line of treatment is indicated which is directed less at local than at general conditions and which probably offers greater promise of success as a means of prevention. At the same time, seeing that the devastating results of chronic intestinal intoxication are slow and insidious, cases which can be "caught early" have a fair prospect of improvement and of a cessation of the process by removal of the cause. The general treatment indicated is that of the intestinal condition and mainly consists, briefly, in disinfecting the colon, preventing reinfection by careful revision of the diet, and the use of vaccines made from the intestinal flora. It must further be insisted that this treatment must be carried out in no half-hearted way.

One of the first indications of success in reference to the ear condition is not seldom a partial or complete relief from the tinnitus. At the same time, although I have suggested that general treatment is of greater importance than local measures, I do not mean to say that the latter are useless. The electrophonoïd method of Zünd-Burguet has given me several good results, and in one case (No. 1) a brilliant one. But if one looks for such results it is essential to be prepared to persevere for one or possibly two years, and it is not always easy to persuade deaf patients to persevere; they are as easily cast down as raised up, and too often look for miracles where one can offer only treatments. Many flit from surgeon to quack and back again as a bee flits from flower to flower, although they gather less honey thereby than does the insect. Another local treatment that promises well is diathermy, but so far I have obtained a good result in one case only (No. 7), and then in conjunction with the electrophonoïd.

The following is a selection of seven cases all of whom had typical otosclerosis, with paracusis Willisii,

as occurring in otosclerosis is striking in the light of McDonagh's work on chronic intestinal intoxication. Both are insidious and progressive, and pregnancy in relation to otosclerosis acquires a new explanation. Its hereditary tendency is elucidated, since the hereditary nature of chronic intestinal intoxication is a point stressed by McDonagh, and he considers this as indicating an increased incidence in otosclerosis as time progresses. The changes in the labyrinthine capsule are more easily explained as being rather in the nature of trophic alterations than as the primary cause of the otosclerosis. Tinnitus is usually hissing in character and frequently *precedes* the deafness; it occurs in a high percentage of cases. These points are highly suggestive of a central irritation, and it is significant that the tinnitus is not seldom satisfactorily relieved by efficient treatment of the toxæmia.

It remains to suggest what is the real primary change in the brain which is the starting point of otosclerosis, and to indicate the direction in which further research should move. From the very condensed outline already given it will be seen that the blood changes resulting from the chemical poisons manufactured in the intestine would be similar in the optic thalamus in migraine and in the various forms of amaurotic idiocy (due to degeneration of the cortical cells in the occipital lobes). This change would consist in the precipitation of the altered protein particles of the plasma in the pericapillary lymphatics in the temporo-sphenoidal lobes, which, by taking away electrons from the neurones would cause the cortical cells to undergo degeneration. It is, therefore, in an examination of the cerebral cortex of the temporo-sphenoidal lobes that, I believe, the elucidation of otosclerosis will be found. That the cerebral cortex should be the part of the central nervous system attacked is accounted for by its comparatively recent evolution.

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and all had familial chronic intestinal intoxication. All received treatment of the general condition.

Case 1.—Female, aged 22. Deaf ten years. Tinnitus. Mother deaf. Voice hearing R = 14 in., L = 11 in. General condition treated and electrophonoid used for seventy sittings. Now perfectly healthy with voice hearing R and L = 15 ft., although eighteen months have elapsed since treatment ceased.

Case 2.—Female, aged 32. Deaf and tinnitus ten years. Excreta showed 30 per cent. of *Bacillus fæcalis alkaligenes*. Voice hearing R = 10 in., L = 7 in. Fifty treatments by electrophonoid raised the hearing to R = 34 in., L = 21 in., but treatment was interrupted by her return to the East.

Case 3.—Female, aged 24. Deaf three years, no tinnitus. Familial deafness and chronic intestinal intoxication; 50 per cent. bacillus of epidemic jaundice in excreta. Voice hearing R = 25 in., L = 30 in. Great improvement in general health. Thirty treatments by electrophonoid raised hearing to R = 78 in., L = 57 in., but local treatment interrupted by return to her home abroad.

Case 4.—Female, aged 38. Deafness and tinnitus six years. Chronic intestinal intoxication, 10 per cent. *Bacillus fæcalis alkaligenes*. Voice hearing R = 15 ft., L = 20 in. Whisper R = 12 ft., L = close to. Sixty treatments raised hearing to voice R = 17 ft., L = 50 in., whisper R = 17 ft., L = 9 in. Tinnitus disappeared after the twentieth treatment.

Case 5.—Female, aged 36. Deaf fourteen years, with tinnitus. Became much worse after confinement six years ago. Appendix removed two years ago. Chronic intestinal intoxication, 15 per cent. *Bacillus proteus*. Voice hearing R = 10 in., L = 6 in. Ninety treatments by electrophonoid increased voice hearing to R = 74 in., L = 24 in. Tinnitus much improved.

Case 6.—Female, aged 26. Deafness and tinnitus ten years. Chronic intestinal intoxication, 10 per cent. *Bacillus fæcalis alkaligenes*. Voice hearing R = 26 in., L = 27 in., increased by fifty treatments by electrophonoid to R = 72 in., L = 43 in. Still under treatment.

Case 7.—Male, aged 22. Deaf nine years, with tinnitus. Chronic intestinal intoxication, 15 per cent. *Bacillus fæcalis alkaligenes*. Voice hearing R = 17 in., L = 11 in. one hundred and ten treatments by electrophonoid, which was combined with treatment by diathermy after the first fifty as improvement seemed very slow, have raised voice hearing to R = 98 in., L = 37 in. Still under treatment.

The Causation of Cancer.

By ERNEST F. NEVE, M.D., F.R.C.S.E.

Senior Surgeon to the Kashmir Mission Hospital.

DURING the past few years, investigations as to the nature and cause of cancer have been pursued with great vigour. There has been a very large accumulation of facts. What appears now most necessary is for someone to illuminate these and the results of experimental research with the light of genius and reveal the true nature of the disease. When this is done, we shall probably, as in the case, for instance, of Lister's great work, wonder why the discovery had been so delayed. The notable work of Gye and Barnard, which at the time seemed so important, has not so far received much general confirmation. It would appear to have its chief interest in connection with one type of cancer which may in its origin be of an infective nature.

Two opposing schools of thought still exist—those favouring the parasitic theory and those who do not accept it. The results obtained by the repeated application of tar have been more consistent than those obtained by implantation. That the application of a powerful but irritating antiseptic should be frequently followed by the development of cancer is a result distinctly adverse to the parasitic theory. Indeed, one fact which stands out sharply is that cancer follows irritation.

Lister's experimental work on inflammation, for which he was made a Fellow of the Royal Society in

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CAUSATION OF CANCER

beyond the ultra-violet, we have the infra-red or heat rays, with a wave-length of 1 Å.U. and upwards. Now these have a most notable effect in the production of cancer; I have seen epithelioma as the result of contact of a leg with a hot-water pipe in a factory. Epithelioma of the lip or tongue from clay pipe and cigarette smoking is well known. There is no more striking illustration of the cancer-producing effect of heat than the Kashmir kangri burn epithelioma. The essential cause of this disease is the constant irritation of intense heat from the kangri. This is an earthenware bowl five or six inches in diameter, surrounded by basket work and surmounted by a wicker handle. It is heated by means of wood charcoal and is used by the poorer class of Kashmiri, carried against the skin under a single garment not unlike a smock frock. The primary factor in the causation of kangri cancer is undoubtedly heat. Pinewood is rarely used, the leaves and twigs of the plane, willow wood and witch hazel being chiefly employed. Volatile substances, products of combustion, auxetics, may possibly play a secondary part. I have found by experiment that the temperature to which the skin is exposed may range between 150° and 200° F. Thus, year by year, we have the production of cancer from one particular cause going on under observation.

Since the year 1881 the operations for epithelioma performed in the Kashmir Mission Hospital have been 2,629, and of these over 2,000, or approximately 80 per cent., were for the kangri burn cancer. The seats of election of these growths are the inner sides of the thighs and the anterior surface of the abdomen, above or below the umbilicus. The disease is considerably commoner in men than in women, probably owing to the less continuous use of the kangri by the latter. The average age for onset is between 50 and 60. About 7 per cent. of the cases are over 70. It is rare before

1860, showed that inflammation was due to irritation. There is a parallelism between inflammation and cancer. Both can be caused by physical irritants, such as traumatism, intense heat and electricity, and also by chemical irritants such as pitch, paraffin and auxeties. Inflammation may be set up by vital irritants such as micro-organisms. Under certain circumstances cancer might follow similar irritation. Lister showed by a series of beautiful experiments the central and local nerve action affected by or controlling certain phenomena in inflammation. Has this trophic nerve relationship to cancer received sufficient attention?

The effect of chemical irritants has long been recognized. The danger of repeated applications of nitrate of silver or other caustics to papillomata and similar neoplasms is common knowledge. Then there is a whole series of chemical irritants associated with the prevalence of cancer in certain trades and occupations. Soot, paraffin and tar are known irritants producing cancer. Green¹ has shown that brewers, furriers, tinsplate workers, lead workers, rubber workers and others are specially liable to cancer, and he suggests that sulphuric and sulphurous acids, which at some stage or another are associated with these occupations, are factors. Colwell has made careful investigations into the relation of arsenic, gall-stones, renal calculi, betel nut, etc. Whether these are mechanical, or chemical irritants, or radio-active is, perhaps, of less importance than the undoubted fact that they are all irritants.

The relation of radio-activity to cancer is significant and points in the same direction. For instance, there are the gamma rays of radium with a wave-length of 0.1 Å.U. or less, so potent and hopeful as a curative agent in cancer, so dangerous when improperly used; and X-rays, with a wave-length round about 0.5 Å.U., the cancer-producing effect of which is unfortunately too well known. Further down the spectrum,

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probability of local irritation, possibly augmented by some faulty metabolism? The incidence in elderly people seems to favour the idea that there may be some loss of balance between the action of certain endocrines; or other stimulants (or irritants) may come into play, associated also with some loss of nerve control of the functions of growth and repair.

To sum up: The balance of evidence supports the view that surface cancer of the human body is due to irritation and not to parasitic action from without.

Masses of proliferating cells under the influence of undue stimulation and outlawed from trophic nerve control may, however, themselves assume characters similar to those of parasitic growths.

It is probable that internal cancers arise from similar causes.

Reference.

¹ O. E. Green: "The Cancer Problem: A Statistical Study," Edinburgh, 1911.

the age of 40. Owing to the constant application of heat, the skin of the abdomen and inner aspect of the thighs often appear dry and parchment-like. Every degree of chronic dermatitis is met with, from mere redness, with or without desquamation, to thickened patches, warty projections, or even horny outgrowths. Scars from previous burns are frequent and are usually the first parts to undergo malignant change. One result of the heat is that the pattern of the superficial veins is projected on to the skin as a brown pigmentation. Kangri burn cancer is never found on the back or on the extensor surfaces of the limbs.

I shall now proceed to discuss possible irritants acting *within* the body, and here we pass from solid ground to that which is less firm—indeed, we shall have to indulge in speculation. Certainly, the action of arsenic taken internally is mysterious. Cancer, as we know, sometimes follows. Is there not some resulting peripheral irritation which starts cell proliferation? It does not seem a great step to assume that in the laboratory of the human body irritants may be formed. The effect of adrenal disease on pigmentation, the influence of the pituitary body on growth and of the internal secretion of the ovary on cancer is suggestive.

In India, the extreme rarity of cancer amongst Hindus, who also enjoy a wonderful immunity from uterine fibroids and hypertrophy of the prostate, is interesting and may have some bearing on this subject. Hindus are vegetarians. Does undue consumption of animal food tend to stimulate certain endocrines or other bio-chemical action which sets up irritation?

There is a large group of cancers which arise in glandular acini—those of the breast and alimentary canal. We know that the beginning of these is usually an accumulation of cells or waste products in acini, with blocking of ducts leading to bursting of bounds and infiltration. Is there not here also a

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probability of local irritation, possibly augmented by some faulty metabolism? The incidence in elderly people seems to favour the idea that there may be some loss of balance between the action of certain endocrines; or other stimulants (or irritants) may come into play, associated also with some loss of nerve control of the functions of growth and repair.

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The Treatment of Duodenal Ulcer.

By A. P. CAWADIAS, O.B.E., M.D., M.R.C.P.

Formerly Chief of Medical Clinic, Paris University, Beaujon Hospital.

DUODENAL ulcer being a terminal manifestation, the duodenal localization of a general disease, that is, of a general metabolic disturbance of the body, its treatment is essentially medical. Surgical interference becomes necessary in cases complicated by stenosis, in forms with recurrent hæmorrhages, and also in forms occurring in persons over forty, cases which do not yield to medical treatment and show on radiological examination definite signs of niche. The indication for the surgical treatment of gastric ulcer based on the possibility of malignant transformation (which remains an hypothesis) does not exist in duodenal ulcer, which never shows any such transformation. All the other cases of duodenal ulcer which belong to the domain of the internist, may be divided into three groups: the post-operative cases, the cases seen during a period of hæmorrhage, and those with the common symptom complex of late hunger pain attacks. It is the treatment of these last-named forms that will be discussed.

No attempt will be made to describe all the medical methods of treatment used by various clinicians, but the technique which after a critical and clinical study appears to me as the most effective from the practitioner's point of view will be given.

Clinically duodenal ulcer, which is essentially a chronic disease, is characterised by periods of activity and periods of quiescence. The periods of activity show in general two phases: the phase of intense symptoms

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and the phase of decreasing symptoms. Treatment, therefore, must be considered separately for these phases.

TREATMENT OF THE PHASE OF INTENSE SYMPTOMS.

Etiological Treatment.—In the light of modern physiological research the pathogenesis of ulcer may be described as follows: A series of external etiological conditions acting on a specially predisposed organism determine certain disturbances of the vegetative nervous system and of the metabolic processes of the body (such as hypertony of the parasympathetic and acidosis). Ulcer represents the duodenal or more precisely the protoduodenal* localization of these disturbances and occurs on account of certain localizing conditions.

A thorough etiological diagnosis on which the etiological treatment depends consists therefore in determining for each patient all the etiological factors, their proportionate rôle and their mode of combination in each individual case; that is, in making what in modern clinical medicine is called the "etiological constellation diagnosis." The following factors must be taken into consideration for this investigation: (a) the general external etiological factors, such as focal infection, tobacco intoxication, psychical conditions (emotive traumata and psychical conflicts), dietetic conditions (B-vitamin deficiency diet); (b) the internal or constitutional factors of predisposition, principally the degree of constitutional dysfunction of the parasympathetic; (c) the factors which determine the localization on the protoduodenum, such as pyloro-

* I have given the name of protoduodenum to the suprapapillary portion of the duodenum, which is the general site of ulcer, and represents an organ absolutely distinct from the rest of the duodenum (the metaduodenum) and the small intestine. The protoduodenum has special secretory glands found in it, the Brunnerian glands and no valvulae conniventes like the rest of the duodenum. It is therefore a secretory organ and not an organ of absorption. Its morphology, embryological origin, vascularization and innervation are different from those of the rest of the duodenum.

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duodenitis (alimentary, medicamentous, or infective), mechanical displacements of the duodenum, constitutional organ inferiority of the duodenum.

The treatment of these etiological conditions will be attempted as far as this is possible, and in practice much can be done by removing the dietetic, the toxic factors, the psychical conflicts, and the focal infection. Care must be taken not to fall into the very common error which consists in the attribution of a preponderant rôle to a factor which may be, in a particular case, of secondary importance, as this occurs when undue stress is laid on the factor of focal infection. In a real scientific etiological diagnosis, focal infection must be considered not by itself alone, but as to its place in the constellation of the multiple etiological conditions which determine duodenal ulcer. The existence of real active naso-oral infection must be treated with energy, but it is important for the internist to have the expert opinion of a laryngologist or a stomatologist as to the existence and activity of this infection. Doubtful or distinctly non-active cases of naso-pharyngeal or dental infection will be treated on conservative lines. It is physiopathologically demonstrated that focal infection is often of secondary importance and at all events is never exclusive of other conditions. On the other hand, clinical observation shows that many who have had on vague indications many of their teeth—or even all their teeth—extracted, do not show any improvement, but are decidedly worse and bear heavily their crippled condition. Careful individualistic and critical thinking is therefore necessary for taking a decision on this point.

Rest.—Absolutely strict rest is necessary at this period, and the ambulatory treatment must be avoided. Rest in bed for some days with hot applications on the epigastrium (when there is no tendency to hæmorrhages), will bring great relief. This method

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acts on the nervous disturbances which are the basis of the disease.

Psychotherapy.—The intimate connections between the cerebral cortex and the stomach or duodenum through the vegetative nervous system—so precisely investigated during recent years, mainly the work of British physiologists—provides a scientific basis for these psychotherapeutical measures which have proved clinically very effective. Two methods are mainly at our disposition: the method of optimistic reassurance, and the deep analytical method. The first is a sort of stimulating shock treatment applied to the cortex. It acts as a form of suggestion and is continuously practised by every physician who with competence, care, and confidence, follows the treatment of his patient in whom he tries to inspire courage. The object of the deep analytical method is the removal of the psychical conflicts which determine an abnormal condition of the patient's psychical constitution, condition reacting on the visceral lesion, by the mechanism of the abnormal cortico-visceral impulses. I do not think that the intervention of a psychological expert is necessary for that. It is the practitioner or the consultant himself who will try to go deeply into the psychical life of his patient, find out the conflicts, more often the immediate conflicts, to which he is subjected, and try to remove them. A much deeper analysis such as is practised by various psycho-analytical schools and based in great part on theoretical considerations is unnecessary and often dangerous.

Dieto-therapy. — The object of dieto-therapeutic measures consists in giving the patient sufficient nourishment, quantitatively and qualitatively, for his subsistence, by means of foods which do not intensify the gastro-duodenal motility, nor the gastric secretion, nor the metabolic disturbances. The food-stuffs which principally fulfil these conditions are

duodenitis (alimentary, medicamentous, or infective), mechanical displacements of the duodenum, constitutional organ inferiority of the duodenum.

The treatment of these etiological conditions will be attempted as far as this is possible, and in practice much can be done by removing the dietetic, the toxic factors, the psychical conflicts, and the focal infection. Care must be taken not to fall into the very common error which consists in the attribution of a preponderant rôle to a factor which may be, in a particular case, of secondary importance, as this occurs when undue stress is laid on the factor of focal infection. In a real scientific etiological diagnosis, focal infection must be considered not by itself alone, but as to its place in the constellation of the multiple etiological conditions which determine duodenal ulcer. The existence of real active naso-oral infection must be treated with energy, but it is important for the internist to have the expert opinion of a laryngologist or a stomatologist as to the existence and activity of this infection. Doubtful or distinctly non-active cases of naso-pharyngeal or dental infection will be treated on conservative lines. It is physiopathologically demonstrated that focal infection is often of secondary importance and at all events is never exclusive of other conditions. On the other hand, clinical observation shows that many who have had on vague indications many of their teeth—or even all their teeth—extracted, do not show any improvement, but are decidedly worse and bear heavily their crippled condition. Careful individualistic and critical thinking is therefore necessary for taking a decision on this point.

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prescribed as follows :—

R

Tincturæ belladonnæ - - - - 3 drachms .

Sig. : Ten drops to be taken in a tablespoonful of water five minutes before lunch and before dinner.

R

Sodii bicarbonatis - - - - 3 grains

Cretac preparatæ - - - - } 8 grains

Magnesiae ponderosæ - - - - }

Fiat pulvis.

Sig. : One to be taken in a wineglassful of water after each meal. Also one or two to be taken immediately at the onset of a painful attack of the epigastrium.

In cases of constipation the dose of magnesia will be increased and that of calcium carbonate diminished. The contrary will be done when a tendency for diarrhoea exists.

Sodium bi-carbonate must not be given alone in high doses because it brings as a reaction an intense hypersecretion, and makes the condition more chronic and intractable. In certain cases it is well to dispense with it completely.

Protein Therapy.—Although one of the last comers as a therapeutical method of duodenal ulcer, protein therapy has given very good results and opens new horizons in the fight against this disease. The injected foreign protein, or non-protein shock substance, or the products which originate locally at the site of the injection, or, when this foreign protein is injected intravenously, the modification of the colloidal equilibrium of the blood act as a stimulant of the vegetative nervous system, and through that stimulation the general metabolic processes of the body, disorder of which constitutes the basis of duodenal ulcer, are regularized. Two sorts of methods may be used : those of very mild and progressive shock, and those determining a more intense shock. Mild shock may be obtained by the administration of Vaccineurin (an autolysate of *B. Prodigiosus* and *Staphylococcus albus*) intramuscularly or of Novotropine (a plant protein preparation) intravenously.

Vaccineurin is prepared in graduated doses of three series. The first series consists of six injections containing progressive doses of

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milk, cream, and flours. The administration of orange or other fruit juices will help to maintain an adequate C-vitamin intake, and certain B-vitamin preparations will be helpful. The period of active symptoms of duodenal ulcer being essentially transitory, an accurate fulfilment of the conditions of adequate caloric value and vitamin and mineral content of foods is not absolutely necessary. The relief of symptoms corresponding to a diminution of the functional disturbances and to the diminution of the activity of the ulcer is the more immediate indication.

I have found the following diet useful, but, of course, ready-made dietaries can serve only as a general guidance, and individual reactions of the patients to food must be considered.

On awakening.—Juice of an orange.

8 a.m.—3 oz. of cream and milk mixture (whole milk two parts, cream one part). Six tablespoonfuls strained oatmeal with cream (instead of oatmeal, an artificial food such as Mellin's, Benger's, Nestlé's or Allenburys' may be used).

11.30 a.m.—3 oz. of milk and cream mixture. One soft-boiled egg.

2.30 p.m.—3 oz. of milk and cream mixture, or blanc-mange, or junket.

5 p.m.—3 oz. of milk and cream mixture. Six tablespoonfuls of thin cream of wheat.

7.30 p.m.—3 oz. of milk and cream mixture. Mashed potatoes or one soft-boiled egg.

This dietetic prescription will be strictly combined with the alkali-belladonna treatment. In severe cases a pure milk diet will be necessary.

Belladonna-Alkali Treatment.—This treatment represents the most effective pharmaceutical agent for duodenal ulcer. It is what the French clinicians call the *traitement d'attaque*, but far from being the only form of treatment. Belladonna acts by moderating the parasympathetic system which is in a condition of hyperexcitability. Alkalis help the neutralization of gastric hypersecretion and perhaps also in general the alleviation of the acidotic conditions. It will be

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Breakfast.—Farina with cream and sugar. Cream of wheat with cream and sugar. Oatmeal (well strained with cream and sugar).

Luncheon.—Oysters (raw or cooked). Mashed green vegetables. Mashed pulses.

Tea.—Junket.

Dinner.—Green vegetables, mashed. Milk and egg, shaken. Rice pudding.

Adsorption Treatment.—The adsorption treatment will take the place of the alkali-belladonna treatment. Its clinical results are the same, although not so intense. It consists in the use of bismuth, aluminium and gelatine preparations which act by coating the gastric and duodenal mucosa and by forming with the gastric contents a gelatinous or colloidal solution which adsorbs the excess of hydrochloric acid.

The following are various methods of prescribing (they may be used alternatively):—

R

Blismuthi carbonatis - - - - 2 drachms

Fiat pulvis.

Sig.: One to be taken in the morning on awakening, suspended in water. After having taken this dose the patient should lie on his right side, then on his left side, and then on his back. Five minutes in each position. A second dose may be taken in the evening before going to bed.

R

Neutralon

Sig.: Half to one teaspoonful stirred into milk or water, three times a day, half an hour before each meal.

(Neutralon is a synthetic aluminium silicate.)

R

Alocol powder - - - - 1·0 (15 grains)

Fiat pulvis.

Sig.: One to be taken in water half an hour before and half an hour after meals.

In cases of constipation the following formula may be used:

R

Pulveris alocol - - - - 15 grains.

Pulveris rhei rhizomatis - - - - 3 grains.

Fiat pulvis.

Sig.: One to be taken in water half an hour before and half an hour after meals.

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the product and must be made every two or three days. After an interval of ten days the second series will be applied in the same manner, and after another interval of about a fortnight, the third series of injections will be instituted. The doses will be diminished and the injections made at longer intervals if the patient shows any strong reaction consisting in rigor, and fever, occurring from one to three hours or even more after the injection. For novotropine a first intravenous injection of 0.2 c.cm. will be made, and if no intense reaction occurs, another one of 0.3 will be applied three days after. A dose of 0.3 to 0.4 c.cm. three days after the second and so on until we reach 1.0 c.cm.

More intense protein shock treatment is given by the administration of intravenous vaccineurin injections, and of intravenous special T.A.B. vaccine injections in small doses. But in the present state of our imperfect knowledge of this method it is preferable to stick to the mild shock therapy.

TREATMENT OF THE PHASE OF DECREASING SYMPTOMS.

In this phase rest will be less severe. The same psychotherapeutical measures should be employed. Protein therapy also will be continued. The diet will be modified so as to fulfil more completely the condition of adequate caloric value, of protein—fat—carbohydrate balance, and of vitamin mineral content. The principle of giving foods which do not increase the gastric secretion, gastro-duodenal motility, will be maintained. The following dietetic directions will be found useful :—

7 a.m.—Half glass of orange juice.

Breakfast.—Average helping of well-cooked and fine cereal flour with cream and sugar. Soft-boiled egg. Dry toast. Butter.

Luncheon.—(a) Lean fish (whiting, sole, codfish, flounder, fresh haddock, pollock, hake, brill, smelts), or chicken (small quantity). (b) Mashed potatoes or rice. Dry toast. Butter. (c) Egg custard (baked).

Tea.—Very little tea, milk, one or two tablespoonfuls of cream. Biscuit. Toast.

Dinner.—Oatmeal with cream and sugar and butter. Poached egg on toast. Spinach. Compote of fruit.

Alternatively :—

7 a.m.—Other fruit juice.

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that he likes, will show the usual resistance to the application by using the banal argument "Nothing remains for me to eat." He must see at the same time that many foods remain, and that he can arrange his regime with a certain variety.

The following foods must be forbidden. (The individual reactions must be taken into consideration):—

Soups, thick or clear. Cooked fats (bacon). Hard and fermented cheese (Dutch cheese, Gruyère, Roquefort, gorgonzola, etc.). All stewed or fried meats. Sausage, sweetbreads, liver, kidney, tripe, tongue, turkey, goose, duck, wild duck, pigeon, rabbit, hare and venison in general.

All fat fish (sprats, herring, red mullet, eel, mackerel, trout, turbot, salmon). Salted fish (sardines, anchovies, caviare). Clams, shell fish, lobster, mussels.

All sauces, spices (mustard, pickles, nutmeg, pepper). Wholemeal bread. All coarse and stringy vegetables and salads. Pulses, except when they are mashed. Fruit containing many coarse particles (figs). Nuts, walnuts, almonds and olives. Dried fruit. Pastry, chocolate, cocoa and all alcoholic drinks.

MEDICAL VERSUS SURGICAL TREATMENT.

It has been said that often, although the patient is absolutely quiescent and treated medically, a sudden fatal accident such as an hæmorrhage or a perforation may occur, and that to avoid this sudden accident no other treatment than surgical can be instituted. I consider that if the diagnosis of quiescent ulcer is based not only on the symptoms of the patient, but on the objective clinical and radiological examinations, and if the patient carefully follows the indications of the treatment for the quiescent period, no such fatal complication can occur. On the other hand, I have seen patients who have been operated on for duodenal ulcer and who, thinking themselves completely free of any treatment, have given up the prescribed diet, succumbed to such fatal accidents. It must be remembered that a surgeon removes the ulcer, but not the "ulcerous disease," and that even after surgical

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R

Agar-agar	-	-	-	-	-	-	35 grains.
Gelatini	-	-	-	-	-	-	3 drs.
Syrupi	-	-	-	-	-	-	2 ozs.
Aquæ ad	-	-	-	-	-	-	10 ozs.

Sig. : A tablespoonful of this preparation to be taken every morning before breakfast in half a tumblerful of hot water.

Magnesium Peroxide.—This will be used alternatively with the preceding preparations. It acts principally by the oxygen which it evolves in the stomach, and which influences the terminations of the vegetative nervous system, and may therefore be regarded as a sort of internal oxygen therapy. Its clinical effects are not limited to the digestive conditions, but a remarkable effect on the general building up of the body is observed.

R

Magnesium perhydrol powder.

Sig. : Half to one teaspoonful in water immediately after meals, and also when the painful attack occurs.

TREATMENT OF THE QUIESCENT PERIOD.

During the quiescent period absolute rest of course cannot be maintained, but the life of the patient should so be regulated that he may avoid any intense physical or mental over-exertion. Protein therapy may continue at very distant intervals, and the patient must carefully be instructed to take alkalis if by any chance he feels any abdominal disturbance. Care must be taken to maintain normal intestinal evacuation.

The principal element during this period is dieto-therapy. The patient will be instructed that he may organize his diet as he desires, provided he avoids certain foodstuffs. The best way of proceeding consists in having printed a very complete list of foodstuffs from which foods that are not allowed will be struck off. It is an error to give simply the list of forbidden foods, because the patient, seeing that it contains much

Some Clinical Notes on Mercurochrome 220 Soluble.

By HENRY W. S. WRIGHT, M.S., F.R.C.S.

Assistant Surgeon to the German Hospital.

MERCUROCHROME 220 was discovered in 1919 by Dr. E. C. White, while working at the Brady Urological Institute, Baltimore. The war had revived the interest of the medical profession in antiseptics, and a search was made for an antiseptic which would do for the epithelial lined genito-urinary tract what eusol had done for infected wounds in general. Impressed by the fact that phenolphthalein was so harmlessly and effectively excreted by the kidney, Dr. H. H. Young organized a group, headed by Dr. E. C. White, who for three years searched for a combination of phenolphthalein which should be antiseptic. The search ultimately went farther afield, and one of its results was mercurochrome.

In a recent article, Eyre, Notton and Sir William Pope¹ dealt with this drug chiefly from an experimental point of view with regard to its toxicity, and with its clinical use in septicæmia. It is perhaps worth while to attempt to summarize the main facts which have emerged from a prolonged clinical trial of mercurochrome in other fields besides septicæmia.

TOXICITY.

Experience with mercurochrome in this country has shown that its use is associated with a not inconsiderable number of reactions, suggestive of mercury poisoning, such as vomiting and diarrhœa, the material

treatment relapses occur if medical treatment is not continued.

It has also been argued that the patient who has not had his ulcer removed, or in general treated surgically, is subject to a life of careful hygiene and diet which many cannot afford. If we except certain special conditions, these dietetic measures are not so severe and can be followed by anyone, and it has even been remarked that people with hypersthenic gastric syndromes corresponding to slight duodenal ulcers, live a very long life on account of their careful diet. On the other hand, as we have said, the surgeon does not remove the systemic disease that is at the basis of the ulcer. An individual who has been operated on for ulcer must follow absolutely the same dietotherapeutical measures if he wishes to avoid a relapse which is much more frequent than is indicated in textbooks or in the surgical statistics.

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in limiting the febrile anaphylactic type of reaction increases its cumulative effect by delaying its excretion or breakdown in the body.

MODE OF ACTION.

As the antiseptic powers of the body fluids after the injection of mercurochrome are not sufficient to account for the remarkable results often seen, it has been suggested that its action lies, not in virtue of its being an antiseptic, but in its producing the ordinary phenomena of protein shock. It is a very obvious fact, which patients themselves often notice, that the benefit derived is proportional to the severity of the reaction. There is a good deal of experimental and clinical evidence to support this view. For instance, in the treatment of gonococcal infections, mercurochrome appears to produce a negative phase. The following is a typical example:—

17:5:28.—A patient complained of a thick yellow urethral discharge of two days' duration, which, on microscopical examination, was typical of gonorrhœa. 10 c.cm. of mercurochrome in glucose was injected.

18th.—Pus much diminished, and most of the cocci extracellular.

19th.—Discharge almost ceased. Smears showed hardly any pus, but swarms of gonococci. 10 c.cm. of mercurochrome given.

21st.—Urethral discharge very copious. Gonococci intracellular.

22nd and 23rd.—Discharge copious. 12 c.cm. of mercurochrome which was followed by very severe reaction.

24th.—Discharge markedly less.

25th.—Discharge almost ceased. 10 c.cm. of mercurochrome. Followed by severe reaction.

27th.—Slight sticky discharge containing no organisms. This patient had no discharge or gonococci after the 30th. In addition to the mercurochrome, daily irrigations with 1 in 5,000 potassium permanganate were given.

This negative phase is a fairly constant phenomenon in the treatment of gonorrhœa with mercurochrome, and is perhaps one of the reasons why its use in this disease has in many hands proved disappointing.

My house surgeon, Dr. F. Y. Wu, found that, in a large number of observations, there was always an

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ejected being coloured pink. Dr. Eyre and his co-workers have shown that these reactions are, in part at least, due to the amount of mercury in the mercurochrome—and that they vary with the sample used. While working in China, an opportunity occurred to use this drug extensively, since, compared with England, a large proportion of the surgery there may be classified as "septic." The sample used was made by an American firm. It was used in 10 c.cm. doses of a 1 per cent. solution given intravenously. It is remarkable that in three years, using the above dosage, we seldom saw symptoms comparable with those described by Dr. Eyre in his recent paper.

It appears possible that two types of reaction to mercurochrome occur:—

Type 1.—This consists of a rise in temperature of from 101° to 105° F., and is similar to that seen in other kinds of protein or intravenous therapy. It is often accompanied by a rigor, and in patients severely debilitated by sepsis there may be some collapse. This reaction is rarely very severe and always harmless. The temperature drops the following morning, and if it rises again another dose is indicated. Only very rarely were there symptoms of colitis. This febrile reaction is probably due to the introduction into the circulation of a foreign body of large molecular weight, and is in the nature of an anaphylactic reaction. It is this type of reaction which is abolished by the addition of glucose.

Type 2.—The patient has some degree of collapse, associated with rigors, vomiting and diarrhoea. The rejected material is coloured pink. This reaction, superimposed on the other, is due to mercury poisoning. My own experience of this type of reaction extends only to mercurochrome prepared in this country, used as a 1 per cent. solution dissolved in 50 per cent. glucose.

It is important to realize that in this respect the action of mercurochrome is cumulative.

In the treatment of gonorrhoea as recommended by Redewill, Potter and Garrison,² 10 c.cm. are injected every 48 hours. In five consecutive cases there was a severe reaction to the third or fourth injection, accompanied by serious enteritis. Injection every other day does not allow the drug to be excreted rapidly enough to avoid the reaction. It is possible that the glucose

MERCUROCHROME

other antiseptics. In chronic pyelonephritis and pyelitis the patient's urine has been rendered sterile after three or four injections, each given after a week's interval. For instance :—

A Chinese woman, aged 44, complained that for four months she had had fever, rigors, frequency, and pain on micturition. She was very wasted. Cystoscopy and pyelography showed that she was suffering from chronic bilateral pyelonephritis with considerable dilatation of the pelvis and flattening of the calices. The right side was more damaged than the left. The urine from the right kidney showed 0.4 per cent. of urea and that from the left 0.8 per cent. With the urea concentration test the highest concentration attained was 0.9 per cent. This patient was treated in hospital with diuretics and urinary antiseptics for a month, but without any real improvement. But after four pelvic lavages with mercurochrome the temperature was normal, the urine was sterile, and pus was only present in microscopical amounts. Her frequency ceased and she put on weight. The highest concentration of urea, as shown by the urea concentration test, was 1.8 per cent. One year afterwards her urine contained a feeble growth of staphylococci, but she had no fever, very little pus, and her weight was maintained. She was so much better that she refused further treatment.

For irrigation of the bladder in cystitis, and after operations, such as prostatectomy, it is an invaluable antiseptic. It is best used in solutions of 1 in 1,000 to 1 in 5,000; but in obstinate chronic basal cystitis and in prostatitis, a small quantity of 1 per cent. solution left in the bladder or prostatic urethra often produces remarkable results.

There is experimental and clinical evidence to show that mercurochrome is perhaps the best antiseptic we possess for pre-operative sterilization of the skin, since it penetrates deeply and causes no irritation. There is still too much minor superficial sepsis after the usual iodine preparation. Mercurochrome penetrates deeper than iodine and picric acid, and its penetration is more uniform. It stains the deeper layers of the corium and the hair follicles. Traut³ found that in skin transplantates for tissue culture experiments, there were 50 per cent. of failures due to sepsis after picric acid preparation, but that with mercurochrome this source of failure was eliminated. Preparation with mercurochrome

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immediate reduction in the number of leucocytes after the injection of mercurochrome, in spite of the fact that considerable improvement occurred.

CLINICAL USE.

The intravenous injection of mercurochrome in septicæmia of all kinds is well known. There is no point in adding case reports to those already published. Its results seem on the whole better and more reliable than those of intravenous eusol, or other antiseptics. Sometimes its action appears little short of miraculous; often we are left unconvinced whether the patient's recovery is due to its aid or not; and sometimes it seems to produce no effect whatsoever. It is always worth while trying, and if the fall of temperature which follows the reaction is succeeded by a further rise another dose should be injected. This should be repeated till three or four doses have been given.

Septicæmia, however, is not its only indication. It is very useful in acute renal infections. Here, again, it sometimes appears to work miracles, but in interpreting its results we must remember that these infections often improve equally dramatically by themselves. In the chronic renal infections, those caused by streptococci and staphylococci are more often improved than the coli infections. In the metastatic complications of gonorrhœa and in chronic closed vesical infections it is nearly always beneficial.

In my hands it has proved most useful in lavage of the renal pelvis; but here again it is most difficult to assess its real value, for everyone who practises this method of treatment is aware of the improvement which often follows lavage with any suitable solution, or even the mere passage of a ureteric catheter. However, in many cases 5 c.cm. of a 1 per cent. solution injected into the renal pelvis has given the impression that the results from its use are better than those of

The Mouth as an Autobiography.

By F. W. BRODERICK, M.R.C.S., L.R.C.P., L.D.S.

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THE mouth is an open document of enormous importance to the practitioner in an evaluation of the general metabolism of a patient, not only at the time of the examination, but, in addition, evidence is there presented of changes from the normal that have occurred in past life. To this statement I would add that, from the same examination, a very fair idea as to the future health of the individual may be attained. I base this opinion on the fact that I believe that the predisposition to dental caries and to pyorrhœa lies in alterations in general metabolism along opposite lines, and that the very fact that either of these is present, or has existed at some previous time, proves definitely that, at that time, there was a tendency to an alteration from the normal in the one or other direction. With both of these conditions it happens, from the very circumstances of the case, that the destruction of tissue that has resulted from the disease, that of the enamel in the former case and of the supporting alveolus in the latter, is a permanent matter and that even if normality is regained these will remain as a lasting record of the past.

Essentially, my thesis is that the predisposing cause of dental caries is the tendency to a change in the acid base balance of the blood in the direction of excess acidity; that the physiological result of this tendency to change will be an attempt at compensation, one of the consequences of which will be an alteration in the reaction of the saliva in the direction of an

chrome is particularly indicated in operations involving the scrotum and perineum, for it is here that iodine dermatitis is so liable to occur. In using it for this purpose the mode of preparation is important, for mercurochrome, while easily soluble in water, is relatively insoluble in alcohol, the presence of which is essential to its penetrating power. Fortunately, if prepared in the following way it will form an alcoholic penetrating solution. Two grammes of mercurochrome are dissolved in 35 c.cm. of distilled water, and while stirring, 55 c.cm. of 95 per cent. ethyl alcohol are added, and then 10 c.cm. of acetone. The stains which are so disliked by the nursing staff are easily removed by Dakin's solution.

CONCLUSION.

Mercurochrome is a valuable local antiseptic, especially for the skin and genito-urinary tract. When introduced into the circulation its action is probably in the nature of protein shock, and when glucose is added to the solution injected, it tends to have a cumulative action.

References.

- ¹ *British Medical Journal*, 1928, ii.
- ² Redewill, Potter and Garrison, *Journal of Urology*, 1926, xvi.
- ³ Quoted by Scott and Hill, *Journal of Urology*, July, 1925.

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increase in its acidity. Now, the reaction of the saliva is a very important factor in the prevention of dental caries, not so much from the point of view of the neutralization of acids as from that of certain chemical and electrical phenomena which result therefrom. At what is known as the iso-electric point, which differs in different salivas according to the proteins present therein, but which is always to the alkaline side of strict neutrality, the phenomena of ionization and osmosis are at their lowest ebb; at each side of this point these processes function, but in opposite directions. A tooth bathed in saliva will be affected by these chemical and electrical processes, and according as the reaction of that saliva is towards the acid or the alkaline side of this iso-electric point will depend the direction in which the calcium ions will pass; if this change brings about a saliva acid to the iso-electric point, the passage will be from the tooth to the saliva, and a gradual decalcification of the tooth will result; if it produces a saliva with a reaction to the alkaline side, the passage will be from saliva to tooth and a hypercalcification will come about.

This, of course, is not the whole story; the presence of the food plaque forms an important element in deciding the point at which the decalcification will occur, but in the presence of a saliva of a reaction sufficiently to the alkaline side of this iso-electric point the food debris is by itself incapable of doing the damage. Where the salivary reaction is sufficiently alkaline there exists an immunity to dental caries, however filthy the mouth, but where the changes to which this is liable are such that the normal hypercalcification is overbalanced by decalcification there exists a susceptibility. The susceptibility to pyorrhoea, on the other hand, is brought about in an attempt to compensate an alkalosis; as the result of which not

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only will there occur an alteration in the reaction of the saliva farther over to the alkaline side of the isoelectric point which will bring about a hypercalcification of the enamel, and consequently an immunity to dental caries, but in addition the stage will be prepared for a deposition of subgingival calculus in the gingival trough, and as a consequence of the irritation produced thereby there will occur a marginal gingivitis and an infection in this situation which will result in the destruction of the alveolar supporting tissues of the teeth and all those physical signs with which we are familiar in this condition. It happens, therefore, that the presence of carious cavities in a mouth is indicative of a tendency, either now or at some past time, to an acidosis of a greater or less severity, and the presence of pyorrhoea pockets demonstrates the existence of a present or past alkalosis.

Although I contend that in their origins these two conditions are antagonistic, I do not suggest for one moment that it is not possible to find the clinical signs of both present at the same time in the same mouth. For it will be obvious that a cavity having once been formed, this will not automatically heal, and it will remain as a stigma so long as the tooth is in its place, whatever change may have occurred in the general metabolism, even though this change may have been sufficient to have brought about the opposite extreme and now predisposes to pyorrhoea. The contrary also holds good, that pyorrhoea pockets once formed will remain as the definite evidence of an attempt to compensate an alkalosis whatever may be the present condition of the patient.

During the last few years the attention of practitioners has been more and more drawn to the question of a definite constitution or diathesis inherent in the individual, by which and through which they possess a susceptibility or immunity to this or that disease, and there is dawning upon them a new conception of

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the upset of the endocrine autonomic system on which they depend, so the caries or the pyorrhœa do not represent the only evidence of this other upset of the same system in another direction.

Ellis believes that the essential factor behind the diatheses in the types described by him and which rest primarily in difficulties in regulating blood reaction lie in differing gland balances possessed by the individuals in question, for he says: "in these cases the functioning of the adrenals and calcium metabolism looms large," and I contend that the diatheses which are primarily responsible for dental disease are also dependent upon similar circumstances.

Dentists have for years recognized the two outstanding examples of types of teeth: the hard, dark-yellow tooth, with signs of attrition but no caries, in the gouty man with a tendency to arteriosclerosis and chronic nephritis, teeth well preserved into middle age, but then lost from pyorrhœa; as compared with the white, soft, beautiful tooth of the individual with a tendency to tuberculosis, very susceptible to caries, but with firm, sound gums, and no sign of pyorrhœa; yet, curiously enough, a general factor underlying these differences has only quite lately been considered, and is quite unacceptable to the orthodox.

Considered along these lines, where we see that the whole picture, general as well as local, is the result of a constitutional disability in which, through the ease with which an upset in the acid base equilibrium of the blood can come about, we recognize that the endocrine-autonomic system is primarily at fault, the conclusion, then, is almost irresistible that the one and the other are brought about by the same set of circumstances. If this be so, as the dental conditions, through a chain of circumstances into which we need not now go, will precede the general symptoms, a very great deal of useful knowledge can be gleaned from a careful

the origins of disease which in many ways resembles that of the physician of a century or two ago. We are beginning to realize that infection by micro-organisms is not just a simple matter of the invasion of a patient's tissues by the organism in question, but that the resistance of the individual, his diathesis, is an important, if not a more important, matter, and that a consideration of the soil as well as of the seed is essential. As Llewellyn has said: "The diathesis fixes the disease from which the patient will suffer, the infection only fixes the time at which this will take place." As a result of this conception there has grown up the science of biochemistry which deals with the matter of resistance or susceptibility to disease, and the part that is played in this by the endocrine autonomic nervous system which is the deciding factor. If, then, the predisposing causes of dental caries and pyorrhœa are as I have suggested, the very fact of the presence of either of these becomes evidence of an upset in this system, which is definitely and ineradicably inscribed in the document which is presented in the mouth of the individual for those with the necessary knowledge to read. The state of the mouth becomes, therefore, an important feature in the diagnosis, prognosis, treatment, and prevention of disease.

Accepting my contentions of the essential features in the causation of dental disease, we see that these are not in reality disease entities at all, but simply one part and one part only of a disease picture, of a symptom complex or syndrome, the main feature of which is that upset in the acid base balance of the blood which has brought them about. Consequently, there will be other conditions, the results also of the same set of circumstances, which are part and parcel of the same picture. The analogy of Graves' disease is fairly complete; for whereas the exophthalmos and the goitre are not the only conditions dependent upon

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turbance in balance of other glands." This observer recognizes that the dominance of one gland, a pure type, is much less common than compounded types, e.g. a thyro-adrenal, or thymo-pituitary type, and that these compound types will show varying degrees of intermediacy in the kind of teeth which they present. The next highest degree of calcification is shown in the pituitary-centred individuals, their teeth being of a greyish yellow colour, and often presenting disturbances in the forces of occlusion, because the pituitary has great influence in bone development. The most highly calcified teeth he believes to exist in the adrenal-centred individual. These are the most dense, have a yellow colour, and present the greatest degree of resistance to mechanical and chemical injurious influences.

If these suggestions are considered it will be seen that this classification agrees most noticeably with what has gone before, and underlines the fact that the condition of the teeth is in no way the cause of the general disease, but that both the one and the other are the result of the same set of circumstances, both depending, essentially, upon the endocrine make-up of the individual in question, interacting with the involuntary nervous system.

This conception of disease, built upon the biochemical condition of the soil rather than upon the bacteriological idea of the invasion of the body by micro-organisms, removes many of the difficulties that are encountered in the consideration of the chronic infections. Admitting the possibility that evolution may have played a part in producing micro-organisms especially suited to the environment which modern civilized man presents, and to which the majority of animals are immune, the fact that, generally speaking, the former alone suffer from the effects of focal sepsis needs some explanation which this and this

inspection of the mouth.

Further, as from an estimation of the reaction of the saliva, considered in relation to all and every circumstance of the case in question, we are enabled to judge the condition of the acid base balance of the blood, the ease with which this is maintained, and the amount of compensation which is required to prevent the occurrence of definite symptoms of change, I submit that here we have a method of infinite importance in the estimation of diathesis and the probabilities and possibilities of disease or breakdown in the future, according to the strains and stresses to which the patient is liable. This is invaluable in the case of life insurance, to give but one example.

Another example of antagonistic diathesis is that supplied by Eppinger and Hess in the description of the conditions known as vagotonia and sympathetico-tonia, which very definitely depend on the interaction of the two portions of the vegetative nervous system and the endocrine grouping with which each part is associated.

Berman, in his book, "The Glands Regulating Personality," classifies human beings according to the particular gland or glands which would seem to dominate their personality and metabolism. He suggests also that the teeth present varying degrees of calcification according to the degree of dominance of one or more of these glands. Thus, in the thymus-centred individuals, "the teeth are of a milky white appearance and distinctly translucent, their density being the lowest of any group, and their resistance to decay very poor." The next degree of calcification occurs in the thyroid-centred individuals: "the teeth being of a pearly white colour, and of a greater density than those of the thymus type, they are often regular and symmetrical, and the forces of occlusion in them seem pretty well balanced, that is if there is no other dis-

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metabolic upset, though both agreed that psychic influences, such as anxiety and distress, favoured the onset; in no case, however, was it suggested that all these conditions might conceivably be related and that all might have a similar basis. I suggest that some such relationship does exist, and that this helps considerably to explain many circumstances which are otherwise difficult—for example, the co-relation of bad teeth with so many diseased conditions—in that both would be due, primarily, to the same set of circumstances, the element of sepsis only arising as a consequence of the caries or the pyorrhoea, which must obviously have preceded it. Again, the failure, in so many instances, of the removal of the source of infection to bring about a cure or even prevent an increase in the damage, in that the metabolic upset still remains untreated.

So great has been the stress upon sources of infection in general disease, and so little the consideration of metabolic disorders, that at the present time no tooth is safe in the hands of some physicians and radiologists, who out-Herod Herod in the slaughter of the innocents, and rather than that one suspicious tooth should be allowed to remain condemn the whole denture. The position of the dentist, whose misfortune it is to have to fit complete dentures to these unfortunate individuals, and who would fain have a say in the matter of which teeth are useful and above suspicion, is exceptionally difficult, in that the mind of the patient is already poisoned by suggestion, and they are as convinced as the doctor that they must lose all, and unable to realize the burden that they are laying up for themselves. The matter is made worse by the reports of so many radiologists who, without any clinical experience or examination of the patient, condemn teeth for which there is not the slightest cause, from a wrong reading of the radiogram. In all these cases numberless teeth

alone presents.

Probably the most important difference between mankind and the remainder of the animal world lies in the development of the psychological side of their make-up; and the more that mankind has become differentiated from the brutes that perish, the more susceptible has he become to chronic infection. The strain, particularly in this direction, that modern civilization has thrown upon the involuntary nervous system has been such that the adaptation that has been obtained is anything but adequate, in so many instances. This is hardly to be wondered at when we call to mind that barely 6,000 years have passed since the dawn of history and the very beginnings of civilized life, and that this space of time represents at the most some 250 generations, in the course of which Nature has had to adapt for such enormous changes, through the slow method of fixing favourable variations by heredity. Considering that these changes of environment are even now taking place at such a rapid rate it is hardly surprising that adaptation to them should always be somewhat behindhand, and that this, in the very nature of things, should primarily affect the nervous system and the endocrine apparatus through which and by which it works.

The two main functions of this endocrine autonomic system are those of metabolism and bodily defence—two functions which are intimately related to one another; consequently, it is possible to see a connection between the origin of the chronic infections and metabolic disorders, and that these definitely are not those of cause and effect. Consider the rheumatic disorders as an example. At a recent meeting of the British Medical Association at which the etiology of these conditions was fully discussed, there appeared a distinct cleavage of opinion between physicians, one group stressing the underlying infection, another the

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as gastric ulcer, diabetes and arteriosclerosis, to mention but a few, is acknowledged. The conception of a relationship between infection and metabolic disturbances, such as I now bring forward, will explain the various factors producing these conditions, in that such circumstances as worry and anxiety throw a strain upon the vegetative nervous system through an endocrine imbalance.

Cannon has shown that the emotion of fear, through a stimulation of the adrenal glands, prepares the animal, the subject of that emotion, for the exertion of fight or flight, that not only is the amount of adrenaline in the blood increased in order to stimulate the sympathetic portion of the autonomic nervous system, and inhibit the parasympathetic portion, but that, amongst other changes brought about, the assimilation of alkalis and the mobilization of sugar are considerably increased, the former to prevent the occurrence of an acidosis from increased muscular exertion, the latter to provide fuel for the energy expended.

In cases where the prepared-for energy is utilized these excess products are used up and no harmful effects are brought about, but where for any reason this does not materialize they remain in the blood as harmful substances.

Worry and anxiety are the civilized equivalent of fear, and in these conditions the same physiological reactions occur, notwithstanding the fact that, owing to civilized conditions, they cannot be followed by the exertions dependent upon either attack or defence. Here is an instance of maladaptation to environment, in that although the circumstances have changed the physiological results remain the same, and a condition which was of enormous importance to the survival of our ancestors has become one of great detriment to ourselves. Matters are made worse from the fact that in such a state as worry the emotion is not confined to

are being removed with no improvement whatsoever, and simply result in placing the patients in a worse position to fight their complaint.

The beginning of the focal infection scare started, I believe, with a paper on the causation of pernicious anaemia by Dr. William Hunter, who contended that the main underlying factor was a chronic infection; the new treatment of this condition with liver extract must surely suggest that whatever part oral sepsis plays in this condition it cannot be the principal agent in its causation, and this knowledge should lead to a reconsideration of the whole matter of the relationship of local conditions to general disease through a chronic infection. This, I am afraid, is a digression, but it does just serve to illustrate that there is another element in chronic disease besides that of infection, and that the metabolic upset must be considered; in fact, I would suggest that the importance of the infection is only serious in that this in itself, through the additional strain that it throws upon the endocrine apparatus, still further reduces the efficiency and the functional capacity of the glands, and that it is on the breaking of this vicious circle that any improvement which may result from tooth extraction really depends. I would suggest, in its place, that chronic disease is, in reality, the result of a functional incapacity of the endocrine autonomic system brought about through a maladaptation to a civilized environment, which shows itself in metabolic misfunction together with an upset in the defensive mechanism of the body.

Llewellyn believes that rheumatoid arthritis is the outcome of endocrine autonomic imbalance, the tendency to which is inherited and capable of being evoked by psychic, infective, and climatic or physical factors, cold, damp, humidity, etc. That a psychic element may be an etiological factor in many chronic complaints is now recognized, and its importance in such conditions

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carefully considered in relation to all the circumstances of the case we have a method of diagnosis of greater importance even than that of an examination of the urine and the blood, in that these latter demonstrate only diseased conditions, whereas the former gives evidence of change before the general pathological upsets have reached that stage and which if unrelieved will eventually lead to disease.

Lastly, in the treatment of these tendencies towards an acidosis or an alkalosis, on which not only dental disease but all other chronic conditions ultimately depend, rational and scientific measures may be taken which will diminish the difficulties of compensation, and prevent the deleterious effects upon distant organs. Consequently, I submit that the work of an intelligent dentist should not entirely consist of repairing, removing, or replacing damaged teeth, but that through a study of mouth conditions he may become a helpful colleague of the medical practitioner in a medical as well as in a surgical capacity, and that there exists, or should exist, a science of dental medicine in addition to that of dental surgery.

one great stimulus, but to many small and quickly recurring stimuli, which may result either in a chronic overaction of the adrenal glands or in their exhaustion; in both cases the effects upon the autonomic system will be considerable, and metabolic derangement a certainty.

These conditions can be recognized by a study of the mouth and the oral secretions; the effect, for instance, of a chronic increase in alkali absorption will show itself in a tendency to an alkalosis and the production of pyorrhœa. But before this stage is reached the changes in metabolism resulting from the emotion will be mirrored in the reaction of the saliva, which will become more alkaline than it should be for a patient of that age, as demonstrated conclusively by Starr. This observer, working on the metabolism of stammerers, has shown that all states of altered metabolism affect the reaction of the saliva in that they bring about tendencies to change in the acid base equilibrium of the blood, and that the emotional states are no exception to this rule. This brings us back, therefore, to the contentions with which I opened this article, that in the mouth we have a document demonstrating not only past errors of metabolism in the presence of the stigmata of dental caries and of pyorrhœa, but also suggesting the probable condition of the patient in the future by showing the diathesis or susceptibility to disease to which he is liable, a circumstance which well deserves consideration if the function of the physician be that of the prevention as well as the cure of disease. Further, if the reaction of the saliva demonstrates conclusively the state of the acid base equilibrium of the blood, alterations in which reflect the general metabolism of the body consequent upon a functional disturbance of the endocrine autonomic system, on which depends the individual's susceptibility to disease, then in an estimation of this reaction

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The Spas of Czecho-Slovakia.

By W. JOHNSON SMYTH, M.D.

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THE spas of Czecho-Slovakia have long been favourite resorts of English-speaking people, but it has been brought to my notice, since my return from a recent visit there, that practitioners in this country do not seem to be aware how greatly these spas have been improved under the new regime since the Great War.

Two hours by train takes one from the German-Czecho-Slovakian frontier to Carlsbad, which lies on either side of the River Teple, in a picturesque valley bounded by well-wooded mountains that reach a height of 2,000 ft. Its native population is about 3,000. It owes its origin to King Carl IV of Bohemia, who, in 1349, hunted a stag almost into an open well of hot water, and it was therefore called Carl's Bad. Until 1600 it was used chiefly as a bathing station, and since that date it has become a famous drinking centre.

The Sprudel throws its saline water to a height of 28 ft. at a temperature of 160°F., and for drinking purposes it is caught on a ladle as it falls. Its temperature is then 110°F. This Sprudel is the source of all the famous waters of Carlsbad, as from it are led off by pipes the waters that supply all the other drinking centres of the town. The chief saline contents are: mag. sulph., sod. bicarb., and sod. chlorid., in addition to CO₂.

The drinking of the waters commences at 5.30 a.m. and goes on till 8.30 a.m. During these hours 10,000 to 12,000 persons may be seen promenading in the well-

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covered drinking stations, at each of which a first-class band plays classical music. The drinkers sip the waters as they stroll about, and take half a pint every fifty minutes. To swallow the water rapidly would result in its aperient action; it is therefore sipped slowly, and it apparently gets absorbed ere it reaches a distant point in the alimentary canal.

To try what effects the water and the Carlsbad cure would have on myself I consulted Dr. Hermann how best to reduce my weight in seven days, and he prescribed the following routine:—

- (1) *Water drinking*: 6 a.m. to 8.30 a.m.
- (2) *Breakfast* 9 a.m. One cup of tea and one lump of sugar, one roll, one soft-boiled egg.
- (3) *Midday meal*: Chop or steak, green vegetables, stewed fruit.
- (4) *5 o'clock tea*: One cup of tea and one lump of sugar, with a little milk.
- (5) *Dinner*: Two soft-boiled eggs, green vegetables, stewed fruit, no preserves, beer, wines or butter allowed during the day. For drink, Mattoni, a local and pleasant saline table water.
- (6) Walk over mountain rising 1,000 ft. and back twice daily.

For the first two days I felt starved to death, and went to bed like everyone else at 8.30 p.m., hungry, and wondering if life was worth living. I saw my medical friend on the morning of the sixth day, and found my weight reduced by 8 lbs. So I had a good lunch that day, and was thereafter an observer rather than a performer at Carlsbad.

Carlsbad is a wonderful place, with two great hotels. As a bath centre, however, it presents nothing novel—the usual routine of vapour, carbonic acid, saline, mud baths, and so on. 200,000 visitors pass through Carlsbad annually, and there are about 16,000 there daily between May and September. One gets some idea of the Sprudel when one learns that it throws into the air 2,000 litres per minute all the year round, that 23,000 cups of water are consumed daily, whilst there is an annual export of 4,000,000 bottles of the water. Fat men and women seemed in the majority, with many

cases showing evidence of jaundice. The cases that do best there are obesity, diabetes, catarrh of the stomach and bile ducts, but the local practitioners name a longer list ! One thing that struck me was how well the doctors had their patients disciplined, and with what ease diets were arranged in the hotels—meagre diets, of course.

Not far from Carlsbad is Marienbad, a fine hill-station at 2,000 ft. level, in a valley between well-wooded mountain ranges. Dr. Porges drove me round the district, and I had glorious views from the great plateau above the town, where the new hotel and golf links are. Marienbad is clearly the rich man's town, with gorgeous bath establishments, for bathing is in vogue here rather than drinking the cold saline waters. All the springs contain mag. sulph., sod. bicarb., sod. chlorid., and a little iron. At one of the wells they have an arrangement for heating the waters by immersing the tumbler in a trough containing hot water. The full-blooded and obese do well at Marienbad, the mountain air is stimulating, and tissue metabolism goes on apace under treatment. King Edward VII used to go, and always felt benefited by his sojourn.

Franzenbad, about an hour from Carlsbad, is a very pleasant hill-station, 1,500 ft. above sea-level, and has several springs. In addition to mag. sulph., sod. bicarb., and sod. chlorid., the waters are highly charged with carbonic-acid gas and sulphate of iron. The medical men at Franzensbad claim for their waters great powers in correcting conditions of incompetence and sterility. They lay great stress on the powers of their carbonic-acid baths to create conditions of pelvic hyperæmia. To this end they also apply their hot mud baths. They also claim that from the iron content of the water good results follow in cases of anæmia. A German physician once said : "Send your pale cases to Franzensbad, your yellow cases to Carlsbad, and your red cases to Marienbad." I think he was right. There is one spring at

CZECHO-SLOVAKIA SPAS

Franzensbad that supplies a fine table water, the water of Natalie, which is not unlike Perrier. All the waters of Franzenbad are cold.

Going eastward towards Pistany one passes through Prague, the capital of Czecho-Slovakia, which is now one of the most flourishing States in Europe. The Elbe runs through this city, with several fine bridges connecting its two parts. It reminded me of a strange mixture of the cities of London and Rome. It was here that John Hus lived and was burnt, and here also lived good King Wenceslas of Christmas carol fame. I spent two days in this fine city, and then went on to Pistany, which was reached after eleven hours by rail through a flat and uninteresting wheat area until within one hour from the town, when many picturesque castle ruins on the mountain ranges were passed.

Pistany lies in flat country, on the River Wagg, which bifurcates and encloses an island site of several hundred acres. The town is reached from the island by a bridge spanning one arm of the river. Most of the hotels in the town, with the Irma Bath Establishment, situated on the island, belong—and have belonged for 150 years—to the family of Winter, who have developed Pistany with great ability and foresight.

On the island, and in the river surrounding it, are numerous hot springs, which throw up a mud-laden water at 158° F. The water contains silica, aluminium oxide, calcium oxide, ferrous oxide, potassium, magnesium and sodium oxide, and other salts in lesser quantities. Recent investigations have demonstrated undoubtedly radio-active properties. The diseases most suitable for the Pistany treatment are rheumatism and gout affecting the muscles, nerves, joints and the skin. The local practitioners make a long list of diseases which are all cured by the Pistany water or mud, but personally I would limit the cure to the above conditions

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covering, indeed, a vast field of human ailments.

The chief "cures" consist in drinking the water (a minor element of the cure), in the mud packs, and in immersion in the thermal waters. The treatment consists in enveloping the whole body or the affected limb in the hot mud at 100° F., then covering up with a mackintosh and blanket. I tried this on my leg. The hot application is most pleasant, and one perspires very freely. The pack is kept on from twenty to sixty minutes. Over the heart is placed a pad with a coil through which cold water circulates. This prevents a rise in pulse-rate. The mud is of a black character, and feels exactly like butter. The next stage consists in getting the mud washed off the person. This is done by a hot spray close by. Then one walks into the great Pistany pool, which is of a battleship-grey colour, at about 100° F., and as one strolls about in it up to the neck, one feels as if one were walking over melting butter, as the bottom of the pool is covered by the mud. After the pool one lies on a couch for twenty minutes, then dresses and rests in one's bedroom, still perspiring.

Pistany impressed me greatly as a cure centre for the ailments indicated. My hotel was full of lame and ailing folk, chiefly gouty or rheumatic, and I have no doubt whatever but that they derived great benefit. Pistany is by no means an expensive cure centre, and one can find there all the comforts of a *hôtel de luxe* at a very moderate price.

Practical Notes.

The Treatment of Chronic Ulcer of the Leg.

J. W. Sooy observes that in the treatment of chronic ulcer of the leg it is necessary not only to take care of the active ulcerative lesion and to support the failing circulation of the leg, but also to provide a mechanism for the cure of the discharge from the ulcer, the irritating effect of which is a factor of prime importance in the determination of the chronicity of the lesion. A satisfactory dressing must allow a free escape of the slough from the ulcer bed and must exert an elastic pressure upon the granulating surface, and the dressing must have an antiseptic property. Dr. Sooy uses a modification of the original zinc gelatine paste devised by Professor Unna, of Vienna. The paste was originally made by combining gelatin 4 parts, zinc oxide 4 parts, glycerin 10 parts, and water 10 parts. This mixture, when cold, forms a homogeneous white mass, having a rubbery consistency and a melting-point of about 160° F. It is not, however, antiseptic except very slightly, and because of its high melting-point it is not flexible enough to be an ideal paste, while it is only slightly porous. Dr. Sooy has, therefore, modified the dressing in such a manner as to meet these criticisms. The formula of the paste which he employs is as follows:—

R.		
Glycerine	- - - -	1,900 gm. (1,425 o.cm.)
Gelatin	- - - -	625 gm.
Water	- - - -	1,900 o.cm.
Zinc oxide	- - - -	250 gm.
Phenol	- - - -	1.50% of total volume
		<hr/>
		4,675 gm.=10 lb.

Sig.: This paste is sufficient for seven dressings.

During a period of seven months Dr. Sooy has treated in his clinic 300 cases of chronic ulcer of the leg by this method, and of these 85 per cent. show entirely satisfactory healing, while the remaining 15 per cent. are still in the earlier stages of treatment and show satisfactory progress. All the patients are ambulatory and are able to follow their daily occupations without restriction. The length of time a bandage may be left in place depends on the amount of cedema and the amount of exudate from the granulating surface.—*(Journal of the American Medical Association, April 6, 1929, p. 1157.)*

The Treatment of Furuncles and Carbuncles.

A. Raiga has treated a series of forty-five cases of furuncle and carbuncle with bacteriophage (d'Herelle) of various types, the best results being obtained with antistaphylococcus bacteriophage. The method employed was both local and general, the bacteriophage being applied locally as a dressing or an injection, or generally in subcutaneous injections, on from one to four occasions. In the great majority of the cases no incision was necessary, and the condition rapidly cleared up with the above treatment, fever and pain often

disappearing in a few hours, the inflamed area undergoing rapid purulent liquefaction with elimination of the core, and the inflammation subsiding. In a few cases the furuncles recurred, but in no case of carbuncle did this occur.—(*La Presse Médicale*, February 9, 1929, p. 187.)

The Results of Treatment of Gonorrhœal Joints.

P. Hubmann records the results of the "functional treatment" of joint gonorrhœa, which consists in producing passive congestion of the affected joint, the administration of vaccines and protein shock, and above all, early passive movements of the joint. Active movements must also be encouraged as soon as possible. Under the congestive treatment pain is relieved so early that movements soon become possible, but in all cases the first time passive movements are attempted an injection of 2 per cent. novocain is made into the joint. In suppurating joints, if thick pus is obtained on aspiration, carbolic acid is injected. In addition to the treatment of the joints, the primary lesion is thoroughly treated. With such treatment, 78 per cent. of cases recovered complete or practically complete function at the joint with at the most a 10 to 15 degree limitation of movement. In 22 per cent. a partial or well-marked stiffness persisted. The best results were obtained in those cases in which the primary lesion had previously been treated.—(*Deutsche Medizinische Wochenschrift*, March 29, 1929, p. 532.)

The Treatment of Thrombo-angiitis Obliterans.

A. M. Rechtman insists that early diagnosis with efficient treatment over a long period of time will change the present questionable outlook regarding thrombo-angiitis obliterans to a more favourable prognosis. Every case given ambulatory treatment had poor results, and Dr. Rechtman now hospitalizes all cases for at least six weeks. The treatment to establish the collateral circulation consists of postural exercises, elevating the feet until they blanch, depressing them until one minute after they are very red and then resting them beneath an electric light bath for about three minutes; this is done on alternate hours eight times a day. Electric light baths, contrast baths, and diathermy are valuable aids. Injections of sodium citrate intravenously counteracts the high viscosity of the blood which is associated with the condition, and large quantities of fluid by the mouth are also beneficial.—(*Medical Journal and Record* [New York], April 3, 1929, p. 367.)

The Treatment of Penetrating Ulcers of the Stomach.

R. Leriche discusses the treatment of callous ulcers of the stomach which have penetrated into the liver or the pancreas, and points out that ulcers so described do not actually penetrate into the neighbouring organs, but are in reality perforated ulcers in which the perforation is covered. After studying a series of patients in whom resection was carried out for this condition, Dr. Leriche came to the conclusion that in cases where the resection seemed difficult it was better to treat the condition by direct muco-mucous and sero-serous

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suture, followed by gastro-enterostomy. He has carried out this procedure in several cases, with encouraging results.—(*Archives des Maladies de l'Appareil Digestif*, February, 1929, p. 216.)

The Value of Liver in the Treatment of Anæmia due to Hæmorrhage.

W. P. Murphy and J. H. Powers have studied the effect of liver, together with a well-balanced diet, on the blood of patients with anæmia due to hemorrhage, in view of the acknowledged value of liver in the treatment of pernicious anæmia. Seventeen surgical patients have been under observation, and were treated with large amounts of beef or calves' liver, together with a diet containing green vegetables, fruit, and red muscle meat; six of these patients received in addition large doses of iron, while seven control patients received neither iron nor a special diet. These seven control patients showed very little change in the concentration of either hæmoglobin or red blood corpuscles during a period of two weeks. The seventeen patients treated with liver or liver and iron showed a definite increase in both hæmoglobin and red blood corpuscles, except in three cases. The patients treated with liver and iron had a greater increase in hæmoglobin than those treated with liver only.—(*Surgery, Gynecology and Obstetrics*, April, 1929, p. 480.)

The Treatment of Gastropptosis.

F. A. Hadley states that most operations devised to cure gastropptosis have proved either inefficient because the supporting tissues are too thin and poor to be plicated or there has been unnatural fixation of the front wall of the stomach. He has for some years used a very simple procedure which has not these disadvantages. The falciform ligament with its round ligament is situated in exactly the right place, and by dividing it three-quarters of an inch (18 mm.) from the liver its free margin can be applied to the pylons and along the anterior surface of the stomach for about three inches (7.5 cm.) and fastened to it with stitches. The short (three-quarters of an inch) stump is fastened to the rectus sheath when sewing up, to prevent anterior tilting down of the liver. As the cardiac end of these stomachs has been, by the time they are operated on, drawn out to a tube and the musculature become tired out, Dr. Hadley puts in two or three layers of plication stitches to shorten up this tube, to allow the muscles to regain their lost tone; these stitches must be placed before the ligament is applied. There is so little shock attached to this operation that it can be added to other abdominal procedures.—(*The Journal of the College of Surgeons of Australasia*, November, 1928, p. 236.)

The Injection of Oxygen in Diseases of Children.

W. Mikulowski reports good results in the treatment by injections of oxygen of cases of croup with pneumonia, typhoid fever, and carbon monoxide poisoning in children, and generally in diseases of children in which there is deficient oxygenization due to circulatory or respiratory disturbances. The method employed is the

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subcutaneous injection of oxygen in doses of 100 c.cm.—(*Archives de Médecine des Enfants*, February, 1929, p. 73.)

The Mortality of Intestinal Obstruction.

S. Brill notes, as other authorities have done from time to time, that the mortality following operation for intestinal obstruction seems abnormally high. In a series of 295 cases collected in 1888 the surgical mortality was 70 per cent.; in 1,000 operations collected in 1900 the mortality was 43·2 per cent., a marked improvement; but in a series of 1,089 cases published since 1900, collected in 1925, the mortality was still 41·8 per cent. Dr. Brill analyses 124 cases operated on from September, 1922, to April, 1928, at the hospital of the University of Pennsylvania, among which there were forty-five deaths, a mortality of 36·3 per cent. He comes to the following conclusions. High, simple obstruction is not commonly encountered in the usual cases classed as acute intestinal obstruction. The marked improvement seen in animals with experimental high, simple obstruction, after the parenteral administration of hypertonic saline, cannot be expected in the ordinary case of acute intestinal obstruction. One should not too long delay attacking the primary lesion in attempting to correct the disturbance of the blood electrolytes. Isotonic saline may be preferable to hypertonic saline unless we know the blood chlorides are reduced, since dehydration is always present and we can administer a great quantity of fluid. The most important factor, however, in the high mortality of acute intestinal obstruction is still, as it always has been, delay in carrying out an operation.—(*Annals of Surgery* [Philadelphia], April, 1929, p. 541.)

The Treatment of Senile Tremor.

L. Rosenbund reports observations of twenty-two cases of gross senile tremor which were treated with massive doses of salicylic acid in the form of aspirin. The dosage was as great as that given in acute rheumatic fever, the object being to produce in the body as high a concentration of the drug as possible. 2-3 grams were given during one, or at the most, two hours, followed next day by a similar dose in the same period of time. Another dose may be given on the third day if necessary, but Dr. Rosenbund found that two doses generally sufficed to cause considerable improvement. No toxic symptoms were observed in any case. The extent of the improvement varied, but in many cases in which the tremor had for several years been present patients were able after this treatment to perform such fine movements as threading a needle. No relapses were seen during the period of 1 to 3½ months while the patients were kept under observation.—(*Medizinische Klinik*, April 5, 1929, p. 563.)

The Reasons for Some Failures in Deep X-ray Therapy.

H. A. McCoy, in discussing X-ray therapy in malignant disease, states that sometimes the dose of radiations administered to a tumour fails to destroy all of the cells, and those which are completely destroyed are replaced by fibrous tissues which form an

irregular meshwork in which there remain islets of tumour cells which are still capable of proliferation. Although the growth of such cells is restricted by fibrous tissues which surround them either partially or completely, there yet remains a residuum of cells and of fibrous tissues which is a potential source of metastasis, even if its presence as a tumour is not undesirable. The result in any case cannot be claimed as satisfactory and further treatment is indicated. Such cases of abortive fibrosis are particularly resistant to further radiation treatment because of the efficient protection afforded to the residual tumour cells by the dense fibrous tissues which surround them. Surgical excision of such a tumour is the only treatment which offers a chance of a good result.—(*Medical Journal of Australia*, February 23, 1929, p. 238.)

The Treatment of Otitic Meningitis.

G. J. Jenkins is of opinion that the general principle of the surgical treatment of meningitis must be that of the treatment of a similar inflammatory process elsewhere. The meninges should be drained from the point of maximum infection and the flow encouraged of normal cerebrospinal fluid over the infected area. In most cases, in addition to simple drainage of the subarachnoid space, he washes out the space when possible and introduces a small quantity of specially prepared iodoform; this method has given better results than simple drainage. These patients almost always have a low blood-pressure, and endeavour should be made to raise it, as a low blood-pressure diminishes the flow of cerebrospinal fluid; as much liquid as possible should be given, and also glucose; pituitrin helps for a time, but there seems to be more improvement with digitalis and ephedrin. Atropine or morphine should not be given at any stage, as these drugs also tend to diminish the flow of fluid; the best sedatives are bromides and paraldehyde.—(*Journal of Laryngology and Otology*, April, 1929, p. 239.)

The Causation of Whooping-Cough.

L. W. Sauer and L. Hambrecht publish a study of the etiology of whooping-cough, having carried out a series of experiments in producing whooping-cough in twenty-eight apparently healthy monkeys by thirty-two strains of Bordet-Gengou bacilli obtained from cases of whooping-cough. The animals had been kept under preliminary observation for a week or longer, to ensure a good state of health. After a period of incubation of from one to three weeks, spontaneous paroxysmal coughs followed the injection of the bacilli into the larynx of five of the monkeys, and similar coughs followed inoculation into the noses of three of the monkeys. The bacillus was recovered from deep throat cultures, and also from the larynx, trachea, and lungs after death. The bacillus was recovered during the height of the cough from an animal that had been inoculated with the bacillus recovered, in turn, from the lung of another coughing animal. These experiments would seem to prove the responsibility of *B. pertussis* (Bordet-Gengou) for the causation of whooping-cough.—(*American Journal of Diseases of Children*, April, 1929, p. 732.)

Reviews of Books.

Textbook of Pathology. By ROBERT MUIR, M.D., Sc.D., F.R.S.
Second edition, 1929. Pp. vii and 872 ; illustrations 501.
London : Edward Arnold & Co. 35s.

THE second edition of this textbook by Professor Robert Muir of Glasgow, many of whose former students now occupy chairs of pathology in the universities of the United Kingdom, has undergone revision and considerable alteration, both in the text and as regards the illustrations, since the original edition in 1924. As is inevitable from the inclusion of new matter and other expansion, the volume contains more—almost a hundred more—pages and nearly seventy more illustrations. The outcome of enormous experience and a wide acquaintance with the literature, the text has a pleasant, almost paternal touch imparted to it by occasional references to the work of his former pupils now following his example. In the interesting account of the etiological factors in tumour growth the work of Gye is naturally considered, and it is pointed out that as nearly all the tumours produced in this way have been of the sarcoma type, the question naturally arises : Do tumours of the Rous sarcoma type form a class by themselves, or are all sarcomas of the same nature ? To this, however, an answer cannot yet be given. Attention is drawn to Minot and Murphy's work showing that the administration of liver has a curative effect on pernicious anæmia, and it is pointed out that, though this has not thrown any light on the pathology of the disease, it may eventually be the means of leading to the discovery of its true nature and causation. The condition of sickle-celled anæmia, recently described in the United States, is summarized, and under the heading of Gaucher's disease it is stated that there does not appear to be sufficient evidence for separating from it the cases described as Niemann's disease. The advantages and drawbacks of the term nephrosis, introduced to designate the changes in tubal nephritis, are succinctly set out, and in the section on epidemic encephalitis the question of the herpetic virus is raised. These examples are, perhaps, sufficient to show the thorough nature of the revision.

Favourite Prescriptions, including Dosage Tables and Hints for Treatment of Poisoning. By ESPINE WARD, M.D. Pp. 101.
Second edition. London : J. and A. Churchill. 5s.

THIS useful little book must have found an appreciative number of readers to have made a second edition necessary in two years. There have been a few sections added and others rearranged. Such changes as we have noticed are in connection with ankylostomiasis, arterio-sclerosis, conjunctivitis, alopecia, nephritis, syphilis and seborrhœa. It is surely, however, an oversight that liver is not referred to as a remedy in pernicious anæmia.

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